



**MANGALORE REFINERY & PETROCHEMICALS LTD.**  
(A subsidiary of Oil & Natural Gas Corporation Ltd)

Regd. Office: Kuthethoor P.O., Via: Katipalla, Mangalore-575030  
(India) Phone: 0091-824-2270400 Fax: 0091-824-2271239

**Tender No.: 3200000590      Date: 29.10.2022**



<b>E-OPEN TENDER DOMESTIC FOR PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA</b>	
<b>Tender Download Start Date</b>	<b>29.10.2022</b>
<b>Tender Download End Date &amp; Time</b>	<b>18.11.2022: 15.00 Hrs</b>
<b>Pre-bid meeting &amp; Site Visit</b>	<b>04.11.2022 between 10.00 am to 4 pm (IST)</b>
<b>Bid Closing date &amp; Time</b>	<b>18.11.2022; 15.00 Hrs</b>
<b>Unpriced Bid Opening date &amp; Time</b>	<b>18.11.2022; 15.30 Hrs</b>

**MRPL has discontinued publication of Tender Advertisements through newspapers or any other print media.**

The complete Tender/Bidding document is available for view/download on MRPL website <https://www.tenderwizard.com/MRPL> and <http://www.mrpl.co.in>

Further replies to pre-bid queries, all updates, Corrigendum, Addendum, Amendments, Extension in last date of submission of bid, Clarifications etc.,(if any) to the Tender/Bidding document will be hosted on above indicated websites only.

Bidders should regularly visit above indicated website to keep themselves updated.



	Tender for Construction works within MRPL Refinery at Mangalore	
	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE	

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	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

**NOTICE INVITING TENDER (NIT)**

Nauvata Engineering Pvt. Ltd. (Nauvata) for and on behalf of Mangalore Refinery & Petrochemicals Ltd. (MRPL), invites e-bids from eligible Bidders in complete accordance with the following details and Tender document.

Salient features of the tender are as below:

Sl. No.	Description	Details
1	Tender Number	3200000590
2	Brief Description of the Tender	1. Piping & Mechanical Modification Works at MRPL Refinery, Mangalore, Karnataka. 2. Piping & Mechanical Modification Works at PMHBL-Mangalore Premises, Karnataka.
3	Type of Tender	E-Open Domestic - PIPING & MECHANICAL Modification Works with Pre-Filled Schedule Of Rates(SOR)
4	Type of Bid	Two Bid
5	Mode	Electronic Procurement System (EPS)
6	Bidding document fee	Not applicable
7	Bidding Document available on Website	29.10.2022 to 18.11.2022
8	Last Date and time of Online submission of Bids (Bid Due Date)	Up to 15:00 Hrs. (IST) on 18.11.2022
9	Online Opening of Techno-commercial Unpriced Bid	15:30 Hrs. (IST) on 18.11.2022 (*)
10	Last date of Receipt of Bidder's Queries for Pre-Bid Meeting	02.11.2022 17:00 Hrs.


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11	Pre-Bid Meeting	<p>Date: 04.11.2022, Time: 15:30 Hrs. to 16:15 Hrs. (IST)</p> <p>Venue: MRPL Site Netravati Building, Near E Gate, Kuthethoor P.O. Mangalore - 575030</p> <p>Interested Bidders, who would like to join Pre-bid meeting shall send request by e-mail to Project Manager at pm.mrpl@nauvata.com, latest by 02.11.2022, 17:00 Hrs.</p>
12	Project Site Visit	<p>Project Site Visit</p> <p>Date: 04.11.2022, Time: 10:00 AM to 01:00 PM.</p> <p>Bidders are requested to arrange their own transportation for Site Visit.</p> <p>Contact Person for Site Visit:</p> <p>Mr. Rossy John Dsilva - Senior Manager Projects Ph. No. +91-9741421734 E-Mail: d_rossyjohn@mrpl.co.in</p>
13	Earnest Money Deposit (EMD)	<p>Bid Security/Earnest Money Deposit (EMD) of Rs. 7,66,839 /- is required to be submitted by Bidder in form of DD/ BG as defined elsewhere in Tender document. BG format for EMD as provided in GCC shall be used.</p>
14	Price Bid Opening	<p>Date &amp; time shall be intimated to the qualified and accepted Bidders.</p>
15	Duration of Contract / Contract Period	<p>1. Completion within six (6) months from date of LOA/PO. 2. Closure of Contract within 3 (Three) Months from Completion.</p>
16	Purchase Preference for Micro & Small Enterprises (MSE)	<p>Applicable</p>
17	Item(s) Split-able	<p>No. However order is splitable on 60:40 ratio to 2 Bidders</p>


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18	Purchase Preference for PP-LC	Applicable
19	Relaxation in BQC (Financial Turnover & Past Experience) for Start-up Companies	Not Applicable
20	Offer Validity	120 days from Bid Closing date
21	Price Adjustment for Slippage in Completion	Applicable
22	Security Deposit	3% (Three percent) of the Total Contract Value.
23	Defect Liability	Applicable
24	Integrity Pact	Applicable
25	Contact details - Technical Queries	Project Manager Email Id: <a href="mailto:pm.mrpl@nauvata.com">pm.mrpl@nauvata.com</a> Ph. No. +91-080-67209100 (extn:131) Mobile : +91 6364469797
26	Contact person for Commercial Queries bid closing extension etc.	Project Manager Email Id: <a href="mailto:pm.mrpl@nauvata.com">pm.mrpl@nauvata.com</a> Ph. No. +91-080-67209100 (extn:131) Mobile : +91 6364469797
27	Contact person for Queries related to E-tendering (registration and bid submission)	Mr. Dilip Ranganath, & Mr. Jayaprakash K Email: <a href="mailto:eps@mrpl.co.in">eps@mrpl.co.in</a> <a href="mailto:jayaprakash.k@etenderwizard.com">jayaprakash.k@etenderwizard.com</a> Phone No. 0824-2882248 / 2882298
28	Alternate Contact details for E Tendering (registration and bid submission)	Mr. Prabhuswamy, <a href="mailto:prabhuswamy@etenderwizard.com">prabhuswamy@etenderwizard.com</a> Phone No. 080 - 4048 2100
29	Address for submission of Original documents in physical form required as per NIT/ITB	Nauvata Engineering Pvt. Ltd. #42, "A" Block, 6th Floor, Brigade Software Park, 27th Cross Rd, Banashankari Stage II, Bengaluru, Karnataka - 560070 (Please mention the Tender number on the envelope)

Bidders are requested to visit MRPL website <https://www.tenderwizard.com/MRPL> as well as on <http://mrpl.co.in> regularly to keep themselves updated on the Tender. All replies to pre-bid queries, updates, corrigendum, addendum, amendments, extension in last date of submission of bid (if any), clarifications etc to the Tender/Bidding documents will be hosted on above websites only.



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Bidders should regularly visit above websites to keep themselves updated with respect to this Tender.

Request for extension or any queries received from any bidder with less than four working days prior to bid due date shall generally be ignored, since there will not be adequate time for proper communication with Client and other Bidders. Bidders shall submit the bid directly and in their own name without involving any intermediaries.

The Technical & Price Bid Formats should be downloaded, filled & uploaded in the EPS portal <https://www.tenderwizard.com/MRPL>.

**Note:**

\*If any of the dates indicated above happens to be a declared holiday/closed day in MRPL/Nauvata, the next working day shall be considered.



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## 1. INTRODUCTION

Mangalore Refinery & Petrochemicals Ltd (MRPL) operates a 15 MMTPA crude processing refinery with secondary units and Petrochemical complex at Mangalore. MRPL intends to do modification work at MRPL Refinery Site Mangalore and PMHBL site, Mangalore premises as part of Brownfield activity for several piping loops.

MRPL has appointed M/s. Nauvata Engineering Pvt. Ltd. (Nauvata) as Project Management Consultant (PMC) for this project.

Nauvata, for and on behalf of MRPL, invites e-bids in single stage two bid system through e-tendering for Modification Works Package from competent contractors with sound technical and financial capabilities fulfilling Qualification Criteria stated in BQC in this document.



**The LOA to the successful bidder will be awarded by MRPL and all the Invoice Payments as per the PMC Certified RA Bills will be paid by MRPL as per Terms and Conditions of the contract.**

Pre-filled Schedule of Rates (SOR) is enclosed in the Tender as Forms SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4. Bidder must quote his overall percent plus/ minus to this pre-filled SOR in Form SP-0. The quoted percent (plus/minus) in Form SP-0 will be uniformly applied to all the line-items in the pre-filled SOR in Forms SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 which shall be the Total Contract Value.

Payment will be made for the actual 'as-measured' quantity after execution with no deviation in the Bidder-quoted unit-rates. The Bidder-quoted percentage in Form SP-0 shall be firm and will not be adjusted/ revised during the contract duration and any extension thereof.

Bidder must quote only percent (plus / minus) values in one-cell in Form SP-0 (Price bid format) and GST percentage in the corresponding cell provided in SP-0 form.

	SP-0	Summary carry forward of totals from each of FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4
	SP-2A	Piping Painting : Indicative quantities with pre-filled unit-rates
	SP-2C	Piping Valves Installation: Indicative quantities with pre-filled unit-rates
	SP-2D	Piping Specialty Items Installation: Indicative quantities with pre-filled unit-rates
	SP-2E	Pipe Supports Installation : Indicative quantities with pre-filled unit-rates
	SP-2F	Piping Erection/ Installation: Indicative quantities with pre-filled unit-rates

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	SP-2G	Piping SP Items Supply and Installation Works
	SP-4	Mechanical Erection / Installation Indicative quantities with pre-filled unit-rates

## 2. BRIEF SCOPE OF WORK OF PIPING & MECHANICAL MODIFICATION WORKS CONTRACTOR

Scope of work shall include but not be limited to unloading of Free-Issue material as listed below, supply of other project material as separately listed in the Schedule of Rates, Site installation, Pre-Commissioning and Commissioning of modified piping loops.

All work must be carried out under SIMOPS conditions inside an operational refinery with full participation in the Refinery 'Permit-to-Work' System.

Shut-down planning has to be closely co-ordinated with existing MRPL Refinery operation personnel along with Hot-Work permits for Hot-Tapping in existing piping.

The following items will be free-issue supplied to the Contractor:

- Piping Bulks such as Flanges, Gaskets, Bolts & Nuts
- Piping as per various diameter requirement
- Cartridge Filters
- Centrifugal Pumps
- Lubricity Dosing Package
- Manual Ball, Double Block and Bleed Valves
- Manual Gate, Globe and Check Valves
- Pipe Fittings
- Piping specialty items such as Barred Tees and Y-Type Strainers.
- Motor Operated Valves
- Automated Double Block and Bleed valves
- Pig Launcher (PL-75001) & Pig Receiver (PR-1101) along with its associated items
- Tagged Instrumentation items to be reinstated



For detailed scope of PIPING & MECHANICAL work refer respective volumes of tender and Document No. 20005-GEN-PME-SOW-1000 / Rev 0

## 3. NOT APPLICABLE

## 4. COMPLETION SCHEDULE

The Overall Schedule Completion Date(s) for the works described in the bidding documents shall be as below:

Activities	Time schedule for completion
Mechanical Completion / Completion of the Project	Within Six (6) months from the date of issue of Letter of Acceptance.

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<b>Final Closure of Contract</b>	<b>Within One (3) month from Completion</b>	

## 5. BIDDER QUALIFICATION CRITERIA (BQC):

The Bidders who qualify as per the following criteria are only eligible to quote and Bidders who meet these criteria and submit supporting documents as detailed in their Tenders shall only be accepted.

Proposals submitted by the Bidders who qualify as per the following criteria shall be technically and commercially evaluated. All other proposals are liable to be rejected. Therefore, Bidders are requested to carefully read the Qualification Criteria and furnish authentic and complete information in support of the same.

Bidder shall fulfill the following minimum qualification criteria in order to qualify for this work.

### 5.1 Technical criteria:

The bidder should have successfully completed similar work(s)\* during the last 7 (seven) years ending last day of the month previous to the one in which this tender is invited, for which experience should be either of the following:

- One similar completed work costing not less than Rs. 3,68,08,285 /- (Rupees Three Crore, Sixty Eight lakhs, Eight Thousand, Two Hundred and Eighty Five Only)
- Two similar completed works, each costing not less than Rs. 2,30,05,178/- (Rupees Two Crore, Thirty Lakhs, Five Thousand, One hundred and Seventy Eight Only)
- Three similar completed works, each costing not less than Rs. 1,84,04,143/- (Rupees One Crore, Eighty Four lakhs, Four Thousand, One Hundred and Forty Three Only)

Note: 1. The Above Value shall be exclusive of GST / taxes and duties

\***Similar Work(s)** mentioned as above shall mean as a minimum:

**“Piping / Mechanical works in an operational petroleum refinery / Chemical / Petro-Chemical/ Oil & Gas Plant.”**

- The contract values as indicated at Clause 5.1 above should be exclusive of service tax / GST. In view of this, it has to be ensured that the value of job indicated by the prospective bidders is exclusive of service tax / GST. However, in case the value of completed job indicated in the completion certificates submitted by




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bidders do not have clarity with regard to inclusion / exclusion of service tax / GST, the following shall apply:

- a) The completion certificate submitted by the bidder shall separately indicate the service tax amount included in the value of completed job OR a separate certificate from the respective client, mentioning the service tax amount, if any, included in the value of completed job under consideration should be submitted by the bidder.
- b) In case Service tax / GST amount /component is not specified in the submitted completion certificate, then the amount equivalent to rate of applicable service tax /GST for the year of completion of subject tender shall be deducted from the value of completed job mentioned in the completion certificate to arrive at the value of completed job with out service tax /GST.

5.1.1 Bidders, who had been issued work order(s) and Executed work(s) in MRPL during the last 03 Years, shall provide Completion Certificate(s), for the completed work(s), issued by MRPL.

5.1.2 Relaxation to MSE/ Start-up bidder:

- a) MSE: Pre-qualification criteria with respect to Prior Turnover and Prior experience may be relaxed for Micro & Small Enterprises (to the extent of 15%) as per GOI guidelines subject to meeting of quality and technical specifications.

(For example, if PQC value applicable to other than MSE bidders is Rs. 100/-, the same shall be Rs. 85/- for MSE bidders).



- b) Start Up: Start Ups are not exempted from Prior Turnover and Prior Experience Criteria

5.1.3 For experience based on Composite Works: In case Bidder has executed composite work(s) contract which includes qualifying similar work(s) as stated in Clause 5.1 above, then value of such qualifying similar work(s) out of the total value of composite work(s) shall be considered for the purpose of qualification. For composite works, in the event the value of the qualifying similar work(s) cannot be ascertained from the work order / completion certificate submitted by bidder, copy of Schedule of Rates (SOR), relevant pages of contracts, copy of relevant pages of final bill certified by OWNER for establishing requirement of BQC or written letter from OWNER specifying the nature of work with quantities and values can be submitted for qualification.

5.1.4 A job executed by a bidder for its own plant / projects cannot be considered as experience for the purpose of meeting requirement of BQC of the tender. However, jobs executed for Subsidiary / Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BQC subject to submission of tax paid invoice(s) duly certified by Statutory auditor of the Bidder towards payments of statutory tax in support of the job executed for Subsidiary / Fellow subsidiary / Holding company. Such bidders shall submit these documents in addition to the documents specified in the bidding documents to meet BQC.

5.1.5 A job completed by a bidder as a sub-contractor shall be considered for the purpose of meeting the experience criteria of BQC (Commercial criteria) subject to submission of following documents in support of meeting the "Bidder



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Qualification Criteria”:

- 5.1.5.1 Copy of Work order along with schedule of rates issued by main contractor.
- 5.1.5.2 Copies of completion certificates from the End User / Owner / PMC and also from the Main Contractor. The completion certificates shall have details like work order no. / date, brief scope of work, ordered & executed value of the job, completion date etc.
- 5.1.5.3 However, in case bidder is not able to furnish the completion certificates from the End User / Owner / PMC in his name, then he shall furnish a copy of the approval by End User / Owner / PMC for engaging the bidder as a Sub-Contractor.
- 5.1.6 Joint venture / Consortium bids shall not be permitted for this tender.

**Note:** The contract values as indicated at Clause 5.1 above should be exclusive of service tax / GST. In view of this, it has to be ensured that the value of job indicated by the prospective bidders is exclusive of service tax / GST. However, in case the value of completed job indicated in the completion certificates submitted by bidders do not have clarity with regard to inclusion / exclusion of service tax/GST, the following shall apply:

- (i) The completion certificate submitted by the bidder shall separately indicate the service tax amount included in the value of completed job OR a separate certificate from the respective client, mentioning the service tax amount, if any, included in the value of completed job under consideration should be submitted by the bidder.
- (ii) In case service tax / GST amount / component is not specified in the submitted completion certificate, then the amount equivalent to rate of applicable service tax / GST for the year of completion of subject tender shall be deducted from the value of completed job mentioned in the completion certificate to arrive at the value of completed job without service tax / GST.

## 5.2 Financial Criteria:

- 5.2.1 Average Annual financial Turnover of the bidder, during the last three years ending March 31<sup>st</sup> of previous financial years shall be at least **Rs. 1,38,03,107 /-** (Rupees : One Crore, Thirty Eight Lakhs, Three thousand One hundred and seven only).

**Note A:** For any Bidder, as per their company policy if the financial year ending is other than 31st March, then in that case the financial year as followed in their company shall be applicable. In case the last financial year closing date is within


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9 months of bid due date and audited annual report of immediate preceding financial year is not available, bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year. Otherwise, it is compulsory to submit the financial details of the immediate three preceding financial years.

**5.2.2** Net worth of the bidder as per immediate preceding year's audited financial results shall be positive.

**5.2.3 Working Capital:**

The minimum working capital of the bidder as per the immediate preceding year's audited financial results shall be **Rs 46,01,036 /- (Rupees Forty Six Lakhs, One Thousand and Thirty Six only)**

**Note B:** Same as Para 5.2.1 Note A

In case bidder is unable to meet the working capital requirement as above, the bidder can supplement the working capital with a fund based line of credit from any scheduled bank in India or a commercial bank having net worth more than equivalent INR 100 crore. In such a case, bidder shall furnish a declaration from the bank (dated any date between the tender floatation and bid due date) for availability of unutilized fund based line of credit for the shortfall in working capital as mentioned above, in the format enclosed as Annexure 1 to NIT.

**5.3 GENERAL**

**5.3.1** Bidder to evidence the meeting of financial criteria shall furnish the complete audited annual reports including auditor's reports, balance sheets, profit & loss accounts statement and all other schedules for the preceding three financial years.

**5.3.2** In case a bidder (a Parent Company) is having wholly owned subsidiaries but only a single consolidated annual report is prepared and audited which includes the financial details of their wholly owned subsidiaries, consolidated audited annual report shall be considered for establishing the financial criteria subject to statutory auditor of the bidder certifying that separate annual report of bidder (without the financial data of subsidiaries) is not prepared and audited.

**5.3.3** Further, in case a bidder is a subsidiary company and separate annual report of the bidder is not prepared & audited, but only a consolidated annual report of the Parent Company is available, consolidated audited annual report shall be considered for establishing the financial criteria subject to statutory auditor of the parent company certifying that separate annual report of bidder is not prepared and audited.

**5.4 DOCUMENTS AND DATA REQUIRED WITH BID**

**5.4.1** The bidder shall, in his own interest, furnish complete documentary evidence to justify that the bidder meets the Qualification criteria as given above.



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- 5.4.2 Bidder shall complete and submit the Experience Record Proforma provided under the Proposal Forms of the Bidding Document (Along with supporting documents mentioned) to establish that the bidder meets the Bidder Qualification Criteria as per Clause No. 5.1 & 5.2 of this document.
- 5.4.3 Bidder shall furnish documentary proof of fulfilling the “Bidder Qualification Criteria” as mentioned in Clause Nos. 5.1 & 5.2 above. The documentation shall include but not limited to copies of work order(s) / contract agreements(s) / relevant pages of contract document(s), completion certificate(s), fulfilling the qualification criteria, complete annual reports containing audited balance sheets and profit & loss accounts statement etc. MRPL reserves the right to complete the evaluation based on the details furnished without seeking any additional information.
- 5.4.4 All supporting documents, pertaining to “Bidder Qualification Criteria (Commercial & Financial)” including MSE certificate shall be submitted duly authenticated as follows: Documents shall be submitted duly certified by Statutory Auditor of the bidder or a practicing Chartered Accountant (not being an employee / Director and not having any interest in the bidder’s company) where audited accounts are not mandatory as per law.

OR

Bidder shall submit documents duly notarized by any notary public / Apostille in the bidder’s country or certified true copies duly signed, dated and stamped by an official authorized for this purpose in Indian Embassy / High Commission in Bidder’s country.

OR

Bidder shall submit self-certified documents in original from any one out of CEO or CFO or Company Secretary of the bidder (Limited company only) along with Self-Certification enclosed as in the format enclosed as Annexure 2 to NIT. This option shall not be applicable to Proprietorship / Partnership firms.



- 5.4.5 Bidders shall be required to upload the digitally signed authenticated copies of documents for meeting BQC on the e-tendering portal only. Bidders need not be required to submit the original authenticated documents in physical form to MRPL. In addition, bidder shall also confirm that all authenticated documents submitted for meeting the BQC are certified as per the authentication requirement defined in the bidding document.
- 5.4.6 Wherever the bidder has not submitted the authenticated documents through e-tendering as per the requirement of bidding document, bidder shall submit the original authenticated document in a separate booklet titled as “Documentation against Bidder Qualification Criteria (Commercial & Financial)” with proper index in original within the bid due date.
- 5.4.7 It is clarified that if authenticated documents are either not submitted through e-tendering or not submitted in original, in physical form, offer shall not be considered.


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- 5.4.8 With regards to Financial documents, in case Bidder submits bound published and audited annual financial statements including balance sheet, profit & loss accounts and all other schedules for the preceding three financial years, the same shall be considered without certification of Statutory Auditor / Notarization of Notary Public as per clause above.
- 5.4.9 However, in case the bidder submits either a photo copy of published statement or a translated copy of the published financial statements, the same shall be certified either by statutory auditor or Notary Public, in original as per Clause 5.5.4 above.
- 5.4.10 Any additional documents if deemed necessary to establish the qualifying requirements may be submitted by the Bidder as required.
- 5.4.11 Submission of authentic documents is the prime responsibility of the Bidder. However, MRPL reserves the right of getting the document cross verified, at their discretion from the document issuing authority. In addition, MRPL may verify the credentials of the successful Bidder before award as per their prevailing guidelines.
- 5.4.12 MRPL reserves the right to complete the evaluation based on the details furnished (without seeking any additional information) and / or in-house data, survey or otherwise.
- 5.4.13 Failure to meet the above Qualifying Criteria at 5.1 & 5.2 above will render the bid to be summarily rejected.
- 5.4.14 Bidders are required to submit all such past experience(s) (PTR) meeting the BQC along with relevant supporting documents in the first instance itself, along with the bid. However, MRPL reserves the right to seek any additional supporting documents for meeting the BQC for only those past experiences (PTR) submitted along with the bid. Accordingly, only such past experience(s) shall be considered for qualification, details of which are provided in the bid by the bidder and subsequently no additional past experience (PTR) shall be sought from the bidder.
- 5.4.15 If Bidder is in the Holiday / Blacklist of any CPSU / State PSU / Central or State Government Undertaking. Bidder shall give a self-declaration to this effect.

**6. Rejection Criteria:**



- 6.0 Bidder to quote for all items enlisted in the FORM SP-0 otherwise bid shall be rejected.
- 6.1 Offers received after the due date / time shall be rejected.
- 6.2 “Techno-commercial offer without EMD shall be rejected. However, Govt. Dept/PSU’s / firms registered with NSIC / MSE(Micro and Small Enterprise), vendors registered with State Department of Industries & Commerce (DIC) /Any other body specified by Ministry of MSME (MoMSME) , UdyogAadhaar Memorandum issued by MoMSME , Startups are exempted from submission of EMD”

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- 6.3 Non-compliance to any of BQC/SOR.
- 6.4 Non adherence to technical / commercial terms and incomplete bids and bids in deviation to tender conditions will be liable for rejection
- 6.5 Bidder's failure to enter into Integrity Pact as applicable for the Tender along with the bid duly signed shall be liable for rejection.
- 6.6 If technical bid & price bid are submitted together.
- 6.7 Bids found to have been submitted with falsified / incorrect information.
- 6.8 "The bidders who are on Holiday / Negative list of OWNER/CONSULTANT on due date of submission of bid/ during the process of evaluation of the bids, the offers of such bidders shall not be considered for bid opening / evaluation / Award. If the bidding document were issued inadvertently / downloaded from website, offers submitted by such bidders shall also be not considered for bid opening / evaluation / Award."
- 6.9 Consortium / Joint bids shall not be accepted.
- 6.10 Offers not meeting statutory requirement are liable for rejection.
- 6.11 Bidder to quote for all items enlisted in the FORM SP-0, otherwise bid shall be rejected.

## 7. Bid Evaluation Criteria

- 7.1 The Bidder should accept all the Technical Specification and scope of work given in toto as given in the tender.
- 7.2 Techno Commercially acceptable bids will be evaluated on overall L1 basis. i.e., lowest landed cost to MRPL.
- 7.3 MRPL intends to award the contract to 2 (Two) Contractors in the ratio of 60:40 to L1 and next bidder at L1 rate.
- 7.4 Counter offer/s would be offered to all other bidders, i.e., L2, L3 and so on for acceptance of L1 rate by giving minimum of 2 working days. Bidders who have accepted and confirmed the counter offer within the specified time limit will be ranked in the order of original ranking and will be considered for award of order to the first bidder in the order of their ranking.
- 7.5 If any of the bidders do not confirm within the specified time limit, it will be construed that the bidder has not accepted the counter offer.
- 7.6 MRPL has the discretion to negotiate with L1 bidder, if rates offered by L1 bidder

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are not acceptable to MRPL. In such cases, negotiated/counter offer will be construed as L1 and such negotiated L1 will be offered to other qualified bidders also.

- 7.7 In case of a tie in same rate being quoted by more than one party, then the bidder with higher turnover (3 years Average Annual turnover total as per BQC#) will be considered as lowest ranking tenderer.
- 7.8 In case, if the number of successful bidders are less than the MRPL requirement of Two successful bidders, MRPL reserves the right to re-distribute the left over balance work available to the successful L1 bidder, provided the bidder meet the BQC for the revised work order value.

**7.9 For 100% jobs BQC as follows:**

- a) One similar completed work costing not less than Rs. 6,13,47,142 /- (Rupees Six Crores, Thirteen lakhs, Forty Seven Thousand, One Hundred and Forty Two Only)  
OR
- b) Two similar completed works, each costing not less than Rs. 3,83,41,964 /- (Rupees Three Crores, Eighty Three Lakhs, Forty One Thousand, Nine hundred and Sixty Four Only)  
OR
- c) Three similar completed works, each costing not less than Rs. 3,06,73,571/- (Rupees Three Crores, Six lakhs, Seventy Three Thousand, Five Hundred and Seventy One Only)
- d) Financial Criteria : Average Annual Financial Turnover during the last 3 years ending 31st March of the previous financial year should be at least Rs 2,30,05,178 / - (Rupees Two Crores, Thirty Lakhs , Five Thousand, One Hundred and Seventy Eight Only)
- e) Working Capital : The minimum working capital of the bidder as per the immediate preceding year's audited financial results shall be Rs 61,34,714 /- (Rupees Sixty One Lakhs, Thirty Four Thousand and Seven Hundred and Fourteen only)



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**Annexure-1 to NIT**

(To be printed on Letter Head of bank)

**DECLARATION FROM THE BANK FOR AVAILABILITY OF UNUTILIZED LINE OF CREDIT**

Ref: \_\_\_\_\_

Date: \_\_\_\_\_

We \_\_\_\_\_, a Bank firm having our registered office address  
Confirm that the Company, M/s \_\_\_\_\_, having its registered  
office  
at \_\_\_\_\_ is having account with our bank. Presently, the credit limits of the  
company are as follows:

Fund Based Line of Credit (towards Working Capital like CC Limit)	Amount in (Currency-___)
Sanctioned Line of Credit	
Utilized Line of Credit	
Balance Line of Credit	

[Bank to specify as applicable]

We declare that we are scheduled bank in India; OR

We declare that we are a commercial bank having Net worth more than equivalent INR 1000 Million as per latest audited financial statements.



Yours Faithfully,

**Signature** :

**Name & Designation** :

**E-mail ID** :

**Fax number** :

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Annexue-2 to NIT

**SELF-CERTIFICATION**

I, \_\_\_\_\_ S/o/D/o \_\_\_\_\_, working as  
o  
f

CEO/CFO/Company Secretary (indicate, as applicable) of the Company

\_\_\_\_\_ having its registered  
office at \_\_\_\_\_

certify that all the details including documents pertaining to Bidder Qualification Criteria signed by undersigned vide our offer reference \_\_\_\_\_ against your Enquiry \_\_\_\_\_, are document true, authentic, genuine and exact copy of its original.

It is certified that none of the documents are false/forged or fabricated. All the documents submitted has been made having full knowledge of (i) the provisions of the Indian laws in respect of offences including, but not limited to those pertaining to criminal breach of trust, cheating and fraud and (ii) provisions of bidding conditions which entitle the Owner to initiate action in the event of such declaration turning out to be a misrepresentation or false representation.

I further certify that further documents, if any, required to be submitted by our company, shall be submitted under my knowledge and those documents shall also be true, authentic, genuine, exact copy of its original and shall not be false/forged or fabricated.



**DECLARATION**

I, \_\_\_\_\_ S/o/D/o \_\_\_\_\_, working as  
o  
f

CEO/CFO/Company Secretary (indicate, as applicable) of the Company

\_\_\_\_\_ having its registered office at  
\_\_\_\_\_ with reference to our bid  
\_\_\_\_\_ against your Enquiry document



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\_\_\_\_\_, declare that in case, at a later date, any of the document submitted in our bid referred above is found to be false/forged or fabricated, I, shall be held responsible for the same and Owner has every right to take action against me and my company, as deemed fit as per provisions of the bidding documents including Owner's right to put our company on Holiday/Blacklist for future business with Owner.

Specimen Signature of authorized representative

Signature

Name & Designation (CEO or CFO or Company Secretary)



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TENDER NO. 3200000590

INSTRUCTION TO BIDDER(S) (ITB)



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**INSTRUCTION TO BIDDER(S) (ITB)**

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**INSTRUCTION TO BIDDER(S) (ITB)**
**1.0 GENERAL:**

- 1.1 Mangalore Refinery and Petrochemicals Limited (MRPL), a subsidiary of Oil and Natural Gas Corporation Limited, is operating a 15MMTPA fuels refinery at Mangalore. MRPL intends to do modification work at MRPL Site Mangalore as part of Brownfield activity for several piping loops.
- 1.2 The bidder is advised to read these instructions carefully and to ensure that his response complies fully with the requirements of the tender. Failure to provide the information and documents required by this Invitation to Bid may render the Bid to be unacceptable. Tender should be submitted in the prescribed form supplied by the company only.
- 1.3 The bidder shall download the complete set of tender documents from the website as per the index of the tender, fully read, understand & compile the same as per the various instructions contained herein and in “Instructions to Bidder”.
- 1.4 Every bidder must submit bid strictly in accordance with the conditions and specifications prescribed by MRPL. Special conditions (if any) submitted along with the tender documents by the bidder will not be applicable to this Tender, in case they are in conflict with any of our terms and conditions.
- 1.5 Bidders to note that Physical/ Hard Copy of the Tender Documents shall not be issued from the office of Tender Inviting Authority. Any request in this regard shall not be entertained under any circumstances.

**2.0 COST OF BIDDING:**

- 2.1 The Bidder shall bear all costs associated with the preparation and submission of its bid and MRPL will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

**3.0 SITE VISIT :**

- 3.1 Bidder is advised to visit and examine the site and its surrounding and shall familiarize himself of the existing facilities and environment and shall collect all other information which he may require for preparing and submitting the Tender and entering into the contract. Claims and objections due to ignorance of existing conditions or inadequacy of information will not be considered after submission of the Bid and during the contract period / after contract period. All costs for and associated with site visits shall be borne by the bidder.
- 3.2 The bidder and any of his personnel or authorised representatives will be granted permission by the OWNER to enter upon its premises and lands for the purpose of such inspection, but only upon the explicit condition that the bidder, its personnel or authorised representative shall be understood to have released and indemnified the OWNER and its personnel from and against all liability in respect thereof and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, cost and expenses incurred as a result of such visit.



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**4.0 TENDER INSTRUCTIONS:**

4.1 The Tender document comprises of following sections:-

- Notice Inviting Tender.
- Pre-Qualification Criteria/Bid Evaluation criteria.
- Instruction to Bidder.
- Proposal Forms
- General Conditions of Contract.
- Formats of Credentials / EMD / Security Deposit, etc.
- Integrity pact, etc.
- PQC Compliance, Deviation statement, declaration, etc
- Scope of work / Special Conditions of Contract,
- Price bid format.
- Contract Workers Safety Policy.

4.2 The Tender Documents shall always be & remain the exclusive property of the Owner without any right with the Bidder to use them for any purpose except for submitting the tender in accordance with the provisions of these instructions by the prospective Bidders and for use by the successful Bidder with reference to the work. The Owner shall have no obligation to return to the Bidder the Tender Documents submitted by the Bidder.

4.3 The Tender shall be completely filled in all respects and shall be tendered together with requisite information & annexure. The Bidder is expected to examine the Tender Documents, including all instructions, specifications and drawings in the tendering document. Failure to furnish all the information required by the tendering documents or tender incomplete in particulars or submission of tender not substantially responsive to the tendering document in every respect shall result in rejection of the Tender.

4.4 The Tender Documents, including all instructions, specifications and drawings in the tendering document. Failure to furnish all the information required by the tendering documents or tender incomplete in particulars or submission of tender not substantially responsive to the tendering document in every respect shall result in rejection of the Tender.

4.5 It is hereby stipulated that the Tenderers shall not affect any corrections/ alterations/ modifications in the Tender Documents and various formats contained therein. Any correction/ alteration/ modification in the Tender Documents by the Bidder shall make their tender liable for rejection.

4.6 Originals of the documents related to the tender should be produced as and when asked for verification, and failure to produce such Original document(s) at specified date, time and place would mean rejection of tender for further evaluation.

4.7 When person signing the Tender / agreement is not the sole Proprietor of the company the original Power of Attorney or a Notary certified copy thereof authorizing such person to act and sign on behalf of the company must be enclosed.

4.8 Date format should be DD/MM/YYYY (Date/Month/Year).


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- 4.9 Bidders should get clarified all the technical doubts and other points related to the tender before submitting the priced and un-priced offer.
- 4.10 MRPL reserves the right to accept or reject any or all tenders and at any stage of the tender evaluation process at the company's sole discretion and without assigning any reason thereof.
- 4.11 Any false/fake/incorrect information submitted by the bidder/contractor while submitting the bid will be liable for rejection of bid, action like Forfeiture of EMD, Cancellation of the Order, Forfeiture of Security deposit including Banning/Holiday listing of the Bidder's Company/ Contractor in all CONSULTANT/MRPL establishments.
- 4.12 Any false/fake/incorrect information surfaced out after award of job would lead to action like Forfeiture of EMD, Cancellation of the Order, Forfeiture of Security deposit including Banning/Holiday listing of the Bidder's Company/ Contractor in all CONSULTANT /MRPL establishments.
- 4.13 If the successful bidder, backs out during finalization of tender/after award of order, action will be initiated by MRPL as deemed fit.
- 4.14 The tender terms/ conditions as per SCC (Special conditions of the contract) supersedes all similar terms prescribed under GCC/ Other Conditions of Contract (OCC).
- 4.15 MRPL reserves its right to seek the Originals if needed or inspect the documents at its premises for verification and return. In case, it is found that the bidder has attempted to mislead MRPL on any counts, MRPL may proceed with any action that is deemed fit.
- 4.16 "The item supplied / service provided shall be Environment friendly and Energy efficient".

**5.0 CLARIFICATION REQUESTS BY BIDDER:**

- 5.1 Although the details presented in this Tender document consisting of Conditions of Contract, Scope of Work, Technical Specifications and Drawings have been compiled with all reasonable care, it is the Bidder's responsibility to ensure that the information provided is adequate and clearly understood.
- 5.2 Bidder shall examine the Tender document thoroughly in all respect and if any conflict, discrepancy, error or omission is observed, Bidder may request clarification at any time up to one week prior to the tender closing date. Such clarification requests shall be directed as per the contact details mentioned in the NIT.
- 5.3 Any failure by Bidder to comply with the aforesaid requirement shall not excuse the Bidder, after subsequent award of contract, from performing the work in accordance with the agreement.
- 5.4 Response to queries/ clarifications raised will be sent as expeditiously as possible to all who have been issued / downloaded the Bidding Document, through e-mail and also hosted on CPP Portal. The response shall not form part of the Bidding Document unless issued as an Addendum/ Amendment.
- 5.5 Bidders are expected to resolve all their clarifications/ queries to the Bidding





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Document and submit their bid in total compliance to Bidding Document without any deviation/ stipulation/ clarification.

- 5.6 Pre-bid meeting shall be organised, if specified in NIT/LIB, as per details given in NIT/LIB.

**6.0 CORRIGENDUM/ ADDENDUM/ CLARIFICATION :**

- 6.1 MRPL may, for any reason whether at his own initiative or in response to the clarification requested by the prospective bidder, issue amendment in the form of addendum/corrigendum/clarification during the Tender period and subsequent to receiving the Tenders. Any addendum / corrigendum / clarification thus issued shall become part of Tender document.
- 6.2 For addendum/corrigendum/clarification issued during the Tender period, Bidder shall consider the impact in his Tender. For addendum/corrigendum/clarification(s) issued subsequent to receiving the Tenders, Bidder shall follow the instructions issued along with addendum/corrigendum/clarification(s).
- 6.3 Such Addendum / Corrigendum/ Clarification(s) shall be uploaded on the [www.tenderwizard.com/mrpl](http://www.tenderwizard.com/mrpl) and MRPL website (<https://mrpl.co.in>) / Owner's e-tendering portal and it will not be published in news paper. Prospective bidders should visit the above MRPL website / MRPL's e-procurement site from time to time to make note of corrigendum/addendum/clarification if any. MRPL is not responsible for non-receipt of any communication / information of addendum/corrigendum/clarification.
- 6.4 All such Addendum / Corrigendum / Clarification(s) issued shall form part of the Tender Documents.
- 6.5 It is incumbent on all the Bidders to view, download, understand and furnish Addendum / Corrigendum / Clarification(s) along with his/its/their tender. Any deviation/ clarification due to non-receipt of Addendum / Corrigendum / Clarification(s) at later stage should not be entertained. Any bid without copy of Addenda/ Corrigenda/ Clarification(s), if issued, as mark of its acceptance may not be accepted.

**7.0 CONFIDENTIALITY OF BIDDING DOCUMENT:**

- 7.1 All information disclosed to the Tenderers by way of the Tender Documents shall be considered confidential and any person/ Tenderer shall not part with possession of the Tender Documents or copy or disclose information thereof to any party, except as may be necessary for carrying out the work. It is being understood that the Tender Documents have been downloaded by the eligible Tenderer solely for the purpose of bidding. Where it is found that any Tenderer has violated and has disclosed sensitive and vital information impugning on the security of the installation/ national security, necessary action, as may be called for, may be taken against the Tenderer concerned in addition to his being liable to be black listed and/ or barred from participating in future bids.

**8.0 LANGUAGE OF BID:**




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8.1 The Bid and all correspondence incidental to and concerning the Bid shall be in the English Language. For supporting documents and printed literature submitted in any other language, an equivalent English Translation shall also be submitted. Responsibility for correctness in translation shall lie with the Bidder. In case of any conflict, for the purpose of interpretation of the Bid, the English Translation shall govern.

8.2 In the event of submission of any document / certificate by the Bidder in a language other than English, the English translation of the same duly authenticated by Chamber of Commerce of Bidder's country shall be submitted by the Bidder.

**9.0 PREPARATION AND SUBMISSION OF BIDS:**

9.1 The offer must be complete in all respects, leaving no scope for ambiguity. Bidder is fully responsible for the bid submitted and no relief or consideration can be given for errors and omissions.

9.2 **Date & Time of submission:** Bid must be submitted by the due date and time mentioned in the notice Inviting Tender / Letter inviting Bid or any extension thereof as duly notified in writing on MRPL / e- tender website.

9.3 Bidder shall submit the offer in two parts:



**Part I - Techno-Commercial (un-priced) bid and**

**Part II - Priced bid.**

9.4 Price bid & technical bids if submitted together shall be summarily rejected.

9.5 **Part I - Techno-commercial bid(Unpriced Bid)** shall be submitted with all documents that are called **for in PDF format only**

- I. Bid Form as per FORM-A (FORM OF TENDER for Commercial Bid enclosed in the GCC - Item Rate as a Annexure) & FORM A1(information about tenderer)
- II. Scanned copy of duly authenticated documents in support of meeting the Experience and Financial criteria as per FORM-B1 & B2.
- III. Copy of EMD/Bid Security as per clause 14.0 below
- IV. Power of attorney in favour of signatory (ies) of the bid. Digitally signed authenticated copy of Power of Attorney, shall be uploaded on the e-tendering portal.
- V. Copy of Partnership Deed in case of Partnership Firm or Memorandum & Article of Association in case of Limited Company.
- VI. Compliance to Bid requirement as per FORM-C or in case of Deviation/ Exceptions (Bidder is requested not to stipulate any deviation), as per

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proposal FORM-D. (Sheet-1)for Commercial Section and Sheet-2 for Technical Section)

- VII. Check List duly filled in as per FORM-E.
- VIII. Reply to Commercial Questionnaire as per FORM-F.
- IX. Details regarding PF as per FORM-G.
- X. Declaration by Bidder regarding Black listing/ Holiday listing as per Performa provided in GCC (FORM-P)
- XI. Declaration/confirmation by bidder that they are not blacklisted by any Government Department/ Public Sector on date of submission of bid.(FORM-P1)
- XII. Declaration by the Bidder as per FORM-J.
- XIII. Submission of Undertaking for non-engagement of child labour as per FORM-K
- XIV. Bank details of Bidder as per FORM-L
- XV. Integrity Pact Agreement along with Affidavit, duly signed & Stamped as per FORM-M1 & Affidavit as per FORM-M2.
- XVI. Letter of Waiver on Letter head of Bidder as per FORM-N
- XVII. Technical offer and Engineering details, if any, required as per Bidding Document.
- XVIII. Blank copy (without price/ Percentage BOQ) of Price bid, indicating Quoted / Not Quoted duly signed and stamped.
- XIX. Complete copy Tender document Signed & Stamped on each page in token of acceptance.
- XX. Any other information required in the Bidding Documents or considered relevant by the Bidder.
- XXI. Signed & Stamped copy of Statement of Credentials -Form R.
- XXII. Declaration about Liquidation, Court receivership-FORM-S
- XXIII. Signed & Stamped copy of list of Minimum Manpower to be deployed by the Contractor (SCC Annexure IV).


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- XXIV. Declaration about any Current Litigation/ Arbitration, if any, in which bidder is involved (Form- Q)
- XXV. Cancelled cheque of bidders.
- XXVI. PAN card Copy.
- XXVII. Signed Copy of MRPL Contract Workers Safety Policy (Attached separately as Annexure-VIII of SCC)
- XXVIII. Hard copy of following authenticated documents to be submitted to the address provided:
1. EMD documents (If applicable)
  2. Signed Integrity Pact (If applicable)
  3. Power of Attorney issued by competent Authority

**Note:** Bidders are required to serially number all the pages being appended by them as part of submission to the Technical bid. Such numbering shall include Covering letter, Technical specifications, Items list being offered, Drawings, Bid qualification proof, Testimonials, Certificates, Catalogues, Compliance or Deviation statements, etc as applicable to this Tender and create an Index Page with headings and corresponding page numbers. Declaration as per the format of 'Undertaking by Bidders' duly signed & stamped by the bidder in token of having read and understood all the tender requirements and accept all terms and conditions of the tender including all corrigendum / addendum / clarification issued, if any. In addition to this, all pages of the Tender documents issued by MRPL shall be signed on all pages and submitted/upload along with the Technical Bid / attachment in EPS system.

Bidder shall also include signed and stamped preamble to price bid, the unpriced FORM SP-0 mentioning "Quoted/Not Quoted" and FORM SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 in his technical bid.

- 9.6 **Priced bid (Part II)** shall be submitted in the same format as mentioned/Included in the Tender document. Otherwise, offer will be liable for rejection.
- 9.7 No assumption, stipulation, deviations from terms and conditions or presumptions, etc. shall be made by the bidder while submitting the offer in the Price Part of the Tender. The liability of obtaining all necessary clarity with respect to the tender, its technical aspects and pricing shall be on the vendor. MRPL shall be under no obligation whatsoever to entertain any tender bid which is based on any assumption, stipulation, deviations from terms and conditions or presumptions, etc. and would have the option to reject such bid at their discretion.

**10.0 TENDERS INVITED THROUGH E-PROCUREMENT SYSTEM:**

- 10.1 For tenders invited through E-Procurement System, bids shall be submitted


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through **online (EPS) mode only** on the Owner's e-tendering portal for tenders invited through e-procurement mode.

- 10.2 Bidders to upload the Un-priced and Price part of their bids strictly in the Unpriced & Priced folders respectively at the designated place in the e-tender portal. Non Compliance to the same may lead to rejection of their offer.
- 10.3 **Bids submitted in any other form through Telex/ Fax/ Telegram/ E-mail/ Courier/ Registered Post/ manually shall not be accepted.**
- 10.4 However, documents which necessarily have to be submitted in originals like EMD and any other documents mentioned in the Tender Documents have to be submitted offline. The Owner shall not be responsible in any way for failure on the part of the Bidder to follow the instructions.
- 10.5 Bidders should avoid the last minute rush to the website for registration of user id and password, enabling of user id and mapping of Digital Signature, SI no, etc., since this exercise require activities from MRPL and EPS provider and needs time. In the event of failure in bidder's connectivity with MRPL/Service provider during the last few hours, bidder is likely to miss the deadline for bid submission. Due date extension request due to above reasons may not be entertained.
- 10.6 Bidders to note that the very act of using Digital Signature Certificate (DSC) for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all pages of the bid document without any exception.
- 10.7 **E-Procurement System Instructions :**
- 10.7.1 Tender is invited on-line on the website [www.tenderwizard.com/MRPL](http://www.tenderwizard.com/MRPL) from the firms having Class IIB or above Digital Signature Certificate (DSC) (with Signing & Encryption Certificate) issued by any agency authorized by Controller of Certifying Authority (CCA), Govt. of India.
- 10.7.2 Offers received online on the e-procurement portal only will be considered for evaluation.
- 10.7.3 The server date and time as appearing on website [www.tenderwizard.com/MRPL](http://www.tenderwizard.com/MRPL) shall only be considered as cut-off time for receipt of tenders. Offers received by any other mode will not be considered.
- 10.7.4 Bidders are responsible for obtaining the digital certificates for participation / submission of bids at their cost.
- 10.7.5 The digital certificate shall be registered on the portal [www.tenderwizard.com/MRPL](http://www.tenderwizard.com/MRPL) and bidders shall upload the bid well in time.
- 10.7.6 Bidder shall download the bidding manual, system requirement and vendor registration manual and JRE setup for portal [www.tenderwizard.com/MRPL](http://www.tenderwizard.com/MRPL) to get acquainted with the procedures for submitting the online bids and load their Bids well within the time provided for bid submission to avoid last minute hassles
- 10.7.7 MRPL shall not be responsible for any delays occurred due to reasons whatsoever in receiving as well as on line submission of offers, including internet connectivity, document uploading/downloading issues etc.
- 10.7.8 Any corrigendum / amendment to the tender will be uploaded on e-Procurement


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site [www.tenderwizard.com/MRPL](http://www.tenderwizard.com/MRPL) and will not be published through other mode. Prospective bidders should visit the above MRPL e-Procurement site from time to time to make note of corrigendum / amendment if any.

10.7.9 In case of any queries regarding registration, bid submission procedure and system related, the bidder shall contact help desk of our e-procurement service provider M/s. ANTRES SYSTEM Ltd., contact person Mr. Dilip Ranganath, contact no. 0824-2882248. Email; [eps@mrpl.co.in](mailto:eps@mrpl.co.in).

10.7.10 Support details as mentioned below;

Support Location	Name	Contact No.	Email ID
Mangalore	Mr. Dilip Ranganath	0824-2882248	<a href="mailto:eps@mrpl.co.in">eps@mrpl.co.in</a>
Bangalore	Mr. Mohan Kumar	080-49352000	<a href="mailto:mohan@antaressystems.com">mohan@antaressystems.com</a>
	Mr. Prabhu Swamy	080-49352000	<a href="mailto:prabhuswamy@antaressystems.com">prabhuswamy@antaressystems.com</a>

**~~11.0 TENDERS INVITED ON MANUAL MODE:~~**

~~11.1 For tenders invited through Manual mode submission, Offer shall be submitted in two parts in two separate sealed covers:~~

~~Part-I Technical & Commercial (un-priced) bid and~~

~~Part-II Priced bid.~~

~~11.2 Both the sealed covers containing Part-I (Un priced Technical Bid) and Part-II (Priced Bid) shall be put in one single cover and submitted by duly super-scribing Enquiry Number & Bid Closing date to the following address, before due date and time :-~~

~~Materials Department,~~

~~Mangalore Refinery and Petrochemicals Limited,~~

~~Kuthethoor, Katipalla, Mangalore 575 030.~~

~~Karnataka, India~~

~~11.3 In case offer received without super-scribing Tender Number it will be treated as unsolicited offer.~~

~~11.4 MRPL will not be responsible for any loss of postal delay.~~

**12.0 PRICE / SCHEDULE OF RATES (SOR) / BILL OF QUANTITIES :**

Preamble to Price Bid, FORM SP-0 and BOQ/SOR is provided in Prefilled FORMs SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4. Unless otherwise agreed to in the terms


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of the Purchase Order/contract, the price shall be firm and not subject to escalation for any reason whatsoever till the execution of entire Purchase order/Contract, even though it might be necessary for the Purchase order /Contract execution to take longer than the Completion period specified in the Purchase order/Contract.

- 12.1 The SOR shall be read in conjunction with all other sections of Tender document.
- 12.2 The price quoted by the Bidder shall be firm and fixed for the completion period of the tendered works, unless stated otherwise.
- 12.3 Percent (Plus/minus) variation must be filled in 'FORM SP-0' in price bid only. In any case, Bidder shall be presumed to have quoted against the tendered description of work and the same shall be binding on the Bidder.
- 12.4 Bidder shall quote in percent (plus/minus) variation for all the items in FORM SP-0 in price bid after careful analysis of cost involved for the performance of the complete item(s) considering all parts and sections of the Tender document. In case any activity though specifically not covered in description of item under 'Schedule of Rates / price bid' but is required to complete the work as per Scope of Work, Scope of Supply, Specifications, Standards, Drawings, General Conditions of Contract, Special Condition of Contract or any other part of Tender document, the item(s) quoted price will deemed to be inclusive of cost incurred for such activity.
- 12.5 All item(s) of work in the Bill of Quantities shall be carried out as per the specifications, and directions / instructions of the Engineer-in-charge and the rates are inclusive of labour, supervision, as well as preparatory, incidental, intermediate / auxiliary / ancillary or enabling works.
- 12.6 The rate shall include all expenditure incurred towards mobilisation and demobilisation. All prices shall be quoted in Indian Rupees unless otherwise instructed.
- 12.7 Bidder shall be considered only if the bidder has quoted for all the items of the "FORM SP-0" in the price bid unless stated otherwise. Tenders which are received with some item(s) left blank / not quoted for all the items of the "FORM SP-0" in Price Bid shall be liable for rejection.
- 12.8 For supply items under the scope of the Contractor supply, the rates quoted by the Bidder shall be all inclusive for delivery of materials at site (F.O.R. destination basis). It shall include Basic Cost, all applicable taxes, duties & levies, inspection charge, transportation charges, transit insurance, auxiliary taxes, etc. as may be applicable. The consignee for despatch of materials shall be the Contractor. However, the Contractor/ Supplier shall be responsible for any incidental consequences arising out during the transit of materials up to destination (site).
- 12.9 Prices quoted in percent (plus/minus) by the Bidders shall be strictly in the given price bid format of "FORM SP-0" in price bid. Prices should not be clubbed with any of items in any way i.e. complete break up as suggested to be given after each item for the materials and works covered under the scope of contract, otherwise the bid may be considered as non- responsive.




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- 12.10 Unless stated otherwise in the Tender Documents, the contract shall be for the complete supplies, services and composite works as described in the relative scope of supplies, services and composite works.
- 12.11 All Government circulars/ guidelines applicable on tender work would be enforced from time to time and it would be binding on the part of the Bidder/Contractor to abide by the same as per stipulations.
- 12.12 Price Bid shall not contain any conditions whatsoever. Any condition mentioned therein, Price bid shall not be considered for evaluation.
- 12.13 **Any incomplete bid in any of the above requirement shall be considered as non-responsive and shall be summarily rejected without any reference whatsoever to the Bidder.**
- 12.14 **Rates to be quoted in Figures & words:**  
The price quoted by the Bidder shall be checked for arithmetic correction, if any, based on rate and amount filled by the Bidder in the standard SOR / Price Bid format. If some discrepancies are found between the rate / amount given in words and figures, the total amount shall be corrected as per the following procedure, which shall be binding upon the Bidder:
- 12.14.1 Prices shall be written both in Words and Figures. In the event of discrepancy between the price in figures and words, the amount entered in words would be taken into consideration for evaluation and finalization of the order.
- 12.14.2 When the rate quoted by the Bidder in figures and words tallies but the amount is incorrect, the rate quoted by the Bidder shall be taken as correct and amount reworked.
- 12.14.3 When there is difference between the rate in figures and words, the rate which corresponds to the amount worked out by the Bidder shall be taken as correct.
- 12.14.4 When it is not possible to ascertain the correct rate, in the manner prescribed above the rate as quoted in words shall be adopted and amount reworked.
- 12.14.5 When Bidder has quoted only in figures and the amount written against the particular item does not correspond to the rate written in figures, then the higher of the rates i.e. rate worked out by dividing the amount with quantity and quoted rate in figures shall be adopted for evaluation purposes and in the event such a Tender is determined lowest Tender, then lower of the rates mentioned shall be considered to award of the works.
- 12.14.6 When Bidder has quoted rates in figures and words but has not calculated the amount and the total contract price, such Tenders shall be rejected forthwith without consulting the Bidder.
- 12.14.7 For item rate tenders where prefilled rates are given and bidders are required to quote percentage in + or -, the following shall apply:
- In case of any discrepancy in the percentage increase / decrease quoted in figures and in words, the percentage increase / decrease quoted in words


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shall prevail.

- In case there is a discrepancy in total amount quoted and the total amount arrived at after calculating the quoted percentage increase/ decrease over prefilled price as per SOR, then the total amount shall be corrected based on the prefilled price as per SOR and the quoted percentage.
- If percentage not quoted or “NIL” is not indicated, it shall be considered “NIL” for price evaluation/award.
- The “Total quoted amount after considering percentage Increase/ Decrease” and “Amount to be adjusted on Pre-filled estimated cost considering the percentage quoted”, shall be in round figures only.
- Bidder to strike out/indicate (+) or (-) in price bid format , as applicable. In case it is not mentioned, it will be considered as (+) and evaluation and ordering shall be carried out accordingly.

12.15 Bidder shall bear, within the quoted rates, income tax liability of both corporate and Personnel as applicable in respect of their personnel and their sub contractor’s personnel, arising out of this contract. Bidder shall also bear, within the quoted rates, the Corporate Tax, as applicable, on the income arising out of this contract.

12.16 The rates quoted by the bidder shall be inclusive of all duties, taxes and levies etc, Central or State or Local bodies, etc. except GST.

12.17 The rates stated in the Schedule of Rates shall not be subject to escalation on any account whatsoever.

### **13.0 BID CURRENCY:**

13.1 Bidders should quote firm prices in Indian rupee only unless otherwise specified else where in this tender. Prices quoted in any other currency shall not be considered.

13.2 For Global tenders, Foreign Bidders may quote prices for materials and services to be imported into India either in Indian Rupees or in Foreign Currency. For the purpose of this clause and any other relevant provisions in these documents, Foreign Currency (FC) shall mean and be limited to US DOLLARS, GREAT BRITAIN POUND, EURO and JAPANESE YEN.



13.3 Bidders shall quote the price for materials and services to be procured from India and for expenses to be incurred in India only in Indian Rupees.

13.4 For evaluation purposes, the bid price shall be converted to Indian Rupees by converting the Foreign Currency into Indian Rupees at the RBI Exchange Rate prevailing on the day of opening of the price bid.

### **14.0 EARNEST MONEY DEPOSIT (EMD):**

14.1 EMD shall be submitted by way of Demand Draft in favor of M/s Mangalore Refinery and Petrochemicals Limited, and payable at Mangalore. Bank Guarantee in place of demand draft shall also be accepted as per format enclosed. **BG shall be valid**



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**for 180 days from the date of bid submission. Offer submitted without requisite / insufficient EMD will be summarily rejected without assigning any reason.**

The irrevocable Bank Guarantee (BG) in the prescribed format if submitted against Earnest Money Deposit shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favor of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s ‘Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925 **SWIFT Code:** UBININBBMAP **MICR Code:** 575026018



Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances.

- 14.2 Earnest Money Deposit (EMD) of value mentioned above should be sent in a separate cover to the following address;

Projects Manager  
MRPL Marketing Terminal Project  
Nauvata Engineering Pvt. Ltd.  
#42, "A" Block, 6th Floor, Brigade Software Park, 27th Cross Rd,  
Banashankari Stage II,  
Bengaluru, Karnataka - 560070.

Super scribing tender number and bid submission date on the envelope. It should reach positively on or before the bid due date and time. Otherwise, the bid will be liable for rejection.

- 14.3 In case of bids invited through EPS, Bidders are also advised to scan the Draft/BG and upload in EPS along with the technical bid document.
- 14.4 Incomplete tender/ tenders **without requisite / insufficient EMD** will be rejected. The Company reserves the right to reject a tender or all the tenders without assigning any reason whatsoever.
- 14.5 EMD may be paid in one of the following forms in a separate sealed cover.
- Demand drafts drawn on Scheduled Bank in favour of Mangalore Refinery and Petrochemicals Ltd, Mangalore.

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- ii. Bank Guarantee in prescribed format (enclosed) which is enclosed, executed by scheduled / Nationalised Bank and valid for a period of 180 days.
- iii. EMD to be sent to the concerned officer before due date/ time.



14.6 Company will not be responsible for loss or late / non receipt of EMD. No interest shall be payable on Earnest Money Deposit. Late receipt of EMD will be summarily rejected. No Cheques will be accepted towards EMD.

14.7 Tender will be summarily rejected under following circumstances

- i) EMD submitted in form of cheque.
- ii) The name of tender mentioned in the BG is different from the tender for which bids have been invited.
- iii) The firm on whose behalf the BG has been furnished is different from the bidder
- iv) The EMD is not of prescribed/requisite value.
- v) The validity of the BG is less than the stipulated period.
- I) Earnest Money is liable to be forfeited if tenderer.
  - Withdraws or modifies offer in full or part during the validity period.
  - Failure of the bidder to honor their offer.
  - Non acceptance of Purchase / Work Order placed by MRPL.
  - Does not confirm of acceptance of order within the stipulated time after placement of order.
  - Inability to perform satisfactorily after receipt of order in case of successful bidder.
  - If document(s)/certificate(s) submitted along with the bid are found false/fake, fabricated, incorrect information.
  - The name of the tender mentioned in the BG is different from the tender for which bids have been invited.
  - The firm on whose behalf the BG has been furnished is different from the bidder.

14.8 The following are exempted from submission of EMD.

- I. The unit is registered with NSIC for the item tendered.
- II. Government Departments/PSU's , Any other body specified by Ministry of MSME (MoMSME) , Udyog Aadhaar Memorandum issued by MoMSME, Start-ups are exempted from submission of EMD.
- III. In- line with the Government Directives, Small Scale Industrial Units registered with National Small scale Industries Corporation (NSIC) under the single point registration scheme shall be exempted from submitting EMD for items registered with NSIC and upto the monetary limit specified in the registration certificate.
- IV. MSE (Micro & Small Enterprises) registered with DIC.
- V. MSEs who are having Udyog Aadhar Memorandum.
- VI. Government Departments/PSU's ,Any other body specified by Ministry of MSME

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(MoMSME) , Start-ups are exempted from submission of EMD”

#### 14.9 Refund of EMD :

- i. If the successful tenderer commences supplies / work and also lodges the security deposit in the manner prescribed and within the period specified, MRPL shall return to him Earnest Money Deposit, paid by him without any interest thereon.
- ii. Earnest Money Deposit will be refunded to all unsuccessful tenderers after finalization of the Tender.

#### 15.0 PRE-BID MEETING :

- 15.1 Pre-bid meeting shall be held as per time & date at the venue specified in the Tender Invitation. In case pre-bid meeting information is not available in the Tender Invitation & the Owner decides to have a pre- bid meeting to clarify any issues, necessary intimation with adequate notice shall be posted on e- tendering portal.
- 15.2 ~~Bidders to submit their queries through the e-tendering portal/e-mail vide Form H& I within 7 days from Tender download start date one day prior to the date of Pre-bid meeting. The queries shall be replied during the pre-bid meeting or the by the Owner will respond through the e-tendering portal to any request for clarification received by the deadline for submission of queries.~~
- 15.3 Brief summary of the queries received through e-tendering portal, queries raised by the attending tenderers during pre-bid meeting and the clarifications given by the Owner respect thereof, as well as any further information which the Owner choose to furnish to the tenderers, shall be posted on e- tendering portal in the form of Minutes of the Meeting or Addendum, which shall form a part of the Tender Documents, unless otherwise specified.
- 15.4 The tenderer or their representatives with necessary authorisation letter can be present during the Pre bid conference, if any.
- 15.5 If pre-bid meeting information is not available in the e-tender notice then the same shall not be held.

#### 16.0 LATEBIDS:

- 16.1 Any bid received by MRPL after the deadline for submission of the bids (including any extension(s) hereof) will be declared “Late” and shall be rejected.
- 16.2 The “Late Bid” shall be returned unopened to the bidder in due course in case of Manual Tenders.

#### 17.0 MODIFICATION AND WITHDRAWAL OF BIDS(APPLICABLE FOR E-TENDERS ONLY):

- 17.1 The Bidder may modify or withdraw its bid after the bid’s submission, provided that the modification or withdrawal is uploaded on e-tender website prior to the deadline prescribed for submission of bids.


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**18.0 BID OPENING:**
**18.1 UN-PRICED (TECHNO-COMMERCIAL) BID OPENING:**

18.1.1 Techno-Commercial (Un-priced) Part (Part-I) will be opened on the scheduled date and time.

18.1.2 For E-Tenders, Bidders can also witness bid opening by logging on to the E-Tendering website through their system using their valid digital signature/certificate.

18.1.3 The bidder or their representative with necessary authorization letter can be present during the technical bid opening in case of Manual tender.

18.1.4 During the opening of Un-priced Part (Part-I), only the names of agencies who have quoted and furnished EMD shall be made public.

**18.1.5 Clarification of Bids:**

Bidders are requested to submit zero deviation bid, strictly as per terms and conditions of the bidding document. Bidder is required to confirm the same in the proforma provided in the bidding documents. Stipulation or any deviation may render the bid liable for rejection

MRPL/ Owner expect the Bidder to comply with the requirements of the Bidding Document without any deviation and submit substantially responsive bid. MRPL/Owner reserves the right to proceed with the evaluation if adequate nos. of techno-commercially responsive bids have been received without raising any CQ/TQ. Therefore, it is expected that bidders submits total compliance bid.

The deviation, if unavoidable, should be furnished as per FORM-D attached. Exception/ Deviations submitted elsewhere in the offer shall not be considered. If any exception/ deviation is acceptable to Owner, the same shall be issued to all bidders through an Amendment. Bidders shall withdraw all other deviations/exceptions, not incorporated in Amendment, failing which offer of such bidders shall not be acceptable. If a bidder takes any further deviations other than those agreed, while submitting the revised price bid/ price implication (if any), his bid shall be rejected outright without any reference. In case any deviations are found in the revised price bid/ price implication, such deviations shall not be taken into cognizance.

**18.2 PRICE BID OPENING:**

18.2.1 Price part of only those bidders, whose bids are considered techno-commercially acceptable, shall be opened. Bidders selected for opening of their price bids shall be informed about the date of price bid opening.

18.2.2 The Price Bid opening shall be done of e-tender portal and Bidders can also witness bid opening by logging on to the E-Tendering website through their system using their valid digital signature/certificate.

18.2.3 ~~In case of manual tenders, bidders may depute their authorised representative~~



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~~during the price bid opening with necessary authorisation letter.~~

- 18.2.4 Any unsolicited reduction in price offered by a bidder within the bid validity by way of discount or revised prices, subsequent to the bid due date, shall not be taken into account for comparison. However, such reduction in price shall be taken into account for ordering if such bidder happens to be recommended as per the originally quoted prices.
- 18.2.5 In the event of any unsolicited price increase sought by any bidder, subsequent to the bid due date, the bid of such a bidder shall be rejected, in case the bidder does not agree to withdraw the price increase. However, in case the unsolicited price increase is known only after price bid opening and the bidder's comparative ranking changes by withdrawal of the price increase, the Bidder shall not be allowed to withdraw the price increase and the bid shall be rejected outright. But, if such a bidder is lowest with or without the price increase, the order shall not be placed with price increase and if the bidder does not agree, the enquiry shall be refloated.
- 18.2.6 Wherever, decision is taken to reject a bid, EMD, if submitted, by the Bidder, shall also be forfeited and action as deemed fit.

**19.0 BID EVALUATION AND AWARD CRITERIA:**

19.1 The Owner reserves the right to consider/ evaluate only substantially responsive tenders. A substantially responsive tender is one, which, in the opinion of the Owner (which shall be final and binding on the Tenderer(s)), substantially conforms to all the terms, conditions, specifications and requirements of the Tender Document without material deviations or reservations in respect of any of the following:

- Scope, Quality or Performance of the work;
- The Owner's rights or the Tenderer's obligations under the contract as per the tender documentation;
- Such deviations the correction of which would affect the competitive position of other tenderers, who have submitted substantially responsive bids;
- Any tender unaccompanied by the Earnest Money in a form which is not acceptable as per the Tender Documents, or falling short of the requirement of the Tender Document, shall be liable for rejection.
- MRPL reserves the right to use in-house information for assessment of capability of bidder and their performance on jobs completed / in progress for evaluation purpose.
- Directives issued by Govt. of India from time to time shall be given due consideration during bid evaluation.

19.2 The following provisions of the bidding document must be adhered to without deviations, failing which the bid shall be considered to be non-responsive and liable for rejection.

- a) EMD/Bid Security
- b) Bid Validity


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- c) Security Deposit
- d) Cancellation of Contract
- e) Suspension of work
- f) Price Adjustment/ Price Reduction for delay in completion
- g) Defect Liability period
- h) Termination of Contract
- i) Time Schedule
- j) Scope of Supplies
- k) Scope of Work
- l) Proforma of all Bank Guarantees
- m) Arbitration
- n) Integrity Pact

- 19.3 Expressions like "can offer if required/ will be submitted later/ will be taken up during detailed engineering after order is placed/ noted etc." will be construed as "TOTAL NON- COMPLIANCE" and the Bid shall be deemed "NON-RESPONSIVE AND INCOMPLETE" and may be summarily REJECTED.
- 19.4 Prior to detailed evaluation of bids, the Owner will determine whether each bid is substantially responsive to the requirement of bidding documents. If the bid is not substantially responsive to the requirements of the Tender Documents, it will be rejected by the Owner, and may not subsequently be made responsive by the Bidder having corrected or withdrawn the non-conforming deviation or reservation.
- 19.5 The requirements of specifications shall be approximately studied for compliance on each of the points. The Bidder may explain clearly his stand on the specifications not complied with. However bids in compliance to each point would be deemed "Responsive Bid".
- 19.6 Bids which do not cover the complete scope of work will be treated as incomplete and shall be rejected.
- 19.7 Bid stipulating completion period/delivery schedule beyond that specified may not be considered.
- 19.8 Substantially responsive bids shall be evaluated by the Owner to ascertain the relative position of the best evaluated bid in the interest of the Owner, for the total of the complete supplies and services covered by the Tender Documents including Technical Specifications and as set out in the Price Schedule.
- 19.9 The evaluation of bids shall be done on the basis of total prices quoted for the complete scope of work and Supply, Services, Composite Works and conditions elsewhere as specified in the tender.
- 20.0 REBATE:**
- 20.1 No suo-moto reduction in price(s) by bidders is permissible after opening of the bid. If any Bidder unilaterally reduces the price(s) quoted by him in his bid after opening of bids, such reduction shall not be considered for comparison of prices but shall be binding on the Bidder if he happens to be selected for award of work.





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**21.0 NOTIFICATION OF AWARD :**

- 21.1 The lowest evaluated bid shall be accepted by owner for award. The Bidder, whose bid is accepted by Owner, shall be issued Order/Letter/Fax of Acceptance (LOA/FOA) prior to expiry of bid validity. Bidder shall acknowledge the receipt.
- 21.2 MRPL shall not be obliged to furnish any information / clarification / explanation to the unsuccessful Bidders as regards non-acceptance of their bids. Except for refund of EMD to unsuccessful Bidders, MRPL shall correspond only with the successful bidder.

**22.0 UNSOLICITED POST TENDER MODIFICATIONS:**

- 22.1 Bidders are advised to quote as per terms and conditions of the Bidding Document and not to stipulate deviations/ exceptions. Once quoted, the Bidder shall not make any subsequent price changes, whether resulting or arising out of any technical/ commercial clarifications and details sought on any deviations, exceptions or stipulations mentioned in the bid unless any amendment to Bidding Document is issued by MRPL/Owner. Similarly, no revision in quoted price shall be allowed should the deviations stipulated by him are not accepted by MRPL/OWNER and are required to be withdrawn by him in favour of stipulation of the Bidding Document. Any unsolicited proposed price change is likely to render the bid liable for rejection.

**23.0 CONTACTING MRPL :**

- 23.1 No bidder shall contact the OWNER on any matter relating to its bid from the time of bid opening till the time Contract is awarded, unless requested to do in writing. Any effort by a bidder to influence the OWNER in the Owner's decisions in respect of bid evaluation or Contract award will result in the rejection of that bidder's bid and action as deemed fit shall be initiated against the bidder.

**24.0 CANVASSING :**

- 24.1 Canvassing in connection with tenders is strictly prohibited and the Tenders submitted by the Tenderers who resort to canvassing shall be liable to rejection.
- 24.2 Subject to the provisions concerning clarification of Bids, no Bidder shall contact the Owner on any matter relating to its bid from the time of the bid opening up to the time that the contract is awarded.
- 24.3 Any effort by the Bidder or Bidder's representative however described to influence the Owner in any way concerning scrutiny, consideration, evaluation of the Bid(s) or decision concerning award of contract shall entail rejection of Bid and action against the bidder as deemed fit.
- 24.4 The Owner will deal with the Bidder on a principal bases, without involvement in any manner in India or abroad of any agent or consultant or associate or other person howsoever described.

**25.0 COLLUSIVE BIDS:**


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- 25.1 In case it appears to the owner, after examining the tenders received, that any 2 (two) or more tenders are collusive or otherwise manipulated to the disadvantage of the owner and against the spirit of ethical competition, the owner reserves the right to summarily reject such tenders. It shall not be incumbent on the owner to prove any collusion or other malpractice in this regard
- 26.0 MULTIPLE/ALTERNATIVE BID :**
- 26.1 A bidder (i.e., the bidding entity) shall, on no account submit more than one bid either directly (as a single bidder or as a member of consortium) or indirectly (as a sub-contractor) failing which following actions shall be initiated:
- 26.1.1 All bids submitted by such bidder (say 'A') directly or indirectly, shall stand rejected and EMD, if any, in case of direct bid submitted by bidder "A" shall be forfeited.
- 26.1.2 If another bidder (say 'B') has proposed bidder 'A' as a sub-contractor then bidder 'B's bid shall also be rejected. However, in case the bidder 'B' has also proposed an alternative sub-contractor who is other than the bidder 'A', then bidder 'B's bid shall be evaluated with the proposed alternative sub-contractor only. Hence, every bidder shall ensure in his own interest that his proposed sub-contractor is not submitting alternative/multiple bids.
- 27.0 CARTEL FORMATION :**
- 27.1 In case any Bidder is found to be involved in cartel formation, his bid will not be considered for evaluation / placement of Order. Such bidder will also be banned from bidding in future.
- 28.0 CORRUPT AND FRAUDULENT PRACTICES:**
- 28.1 Bidders are required to furnish the complete and correct information/ documents required for evaluation of their bids. If the information/ documents forming basis of evaluation is found to be false/ fake/ forged, the same shall be considered adequate ground for rejection of the bids and forfeiture of earnest money deposit.
- 28.2 OWNER requires that the CONTRACTOR observes the highest standard of ethics during the execution of Contract. In pursuance of this policy, OWNER defines, for the purposes of this provision, the terms set forth below as follows:
- "Corrupt Practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of public official in contract execution; and
  - "Fraudulent Practice" means a misrepresentation of facts in order to influence the execution of a Contract to the detriment of OWNER, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive OWNER of the benefits of free and open competition.
  - "False/Fake" means to make or construct falsely. "Faked alibi" is a made, manufactured, or false alibi. Something that is not what it purports to be; counterfeit, an imposter.
  - "Forgery" means the false making or the material altering of a document with the intent to defraud. A signature of a person that is made without the person's consent and without the person otherwise authorizing it. A person is guilty of





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forgery if, with the purpose to defraud or injure anyone or with knowledge that he is facilitating a fraud or injury to be perpetrated by anyone, the actor;

- i. alters any writing of another without his authority
- ii. makes, completes, authenticates, executes, issues or transfers any writing, so that it purports to be the act of another who did not authorize that act or to have been executed at a time or place or in a numbered sequence other than was in fact the case, or to, be a copy of an original when no such original exists.

Utters any writing which he knows to be false in a manner specified in (i) & (ii) above.

**28.3** OWNER may terminate the Contract if it discovers subsequently that the Contractor had engaged in Corrupt Practices or Fraudulent Practices in competing for the Contract.

**28.4** In case, the information/ document furnished by the Contractor forming basis of evaluation of its Bid is found to be false / fake/ forged after the award of the Contract, OWNER shall have the right to terminate the Contract and get the remaining Works executed by a third party at the risk & Cost of the Contractor and without any prejudice to other rights available to OWNER under the Contract such as forfeiture of the Contract Performance Bank Guarantee, withholding of payment etc.

**28.5** In case, this issue of submission of false/fake documents comes to the notice after execution of the Works, OWNER shall have full right to forfeit any amount due to the Contractor along with forfeiture of the Contract Performance Bank Guarantee furnished by the Contractor. Further, any Contractor which is found guilty of any Corrupt or Fraudulent Practice or submission of false/fake /forged documents, shall be put on the negative/ holiday list of OWNER debaring them from future business with OWNER.



**29.0 PUBLIC UTILITY SERVICE :**

**29.1** The Bidder / Contractor shall take on record that MRPL has been declared as a Public Utility Service under Industrial Dispute Act 1947 and Essential Services Maintenance Act 1994 and various other provisions hereby undertake on their behalf and on behalf of the employees under their roll that they refrain from indulging in any activity(ies) which would hamper Industrial peace in MRPL and also would extend their Assistance and support to MRPL to comply with the requirements within mentioned statutory requirement / declaration.

**30.0 INTEGRITY PACT: (Applicable)**

Integrity Pact documents has been attached herewith. The said document shall be signed in all the pages by the signatory of the bidder, who signs the bid and returned with the techno-commercial bid. Offer of those bidders who do not attach the Integrity Pact duly signed shall be summarily rejected without any further reference to the bidder.

**31.0 RAISING DISPUTES/COMPLAINTS. (Applicable for all tenders where Integrity Pact is applicable.)**

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31.1 MRPL has appointed independent external monitors (IEMs). Bidders may raise disputes/complaints, if any, with the nominated Independent External Monitors (IEM). After award of work, the IEMs shall look into any issue relating to execution of contract, if specifically raised before them. The name, address & contact numbers of the IEMs are as given below:

Sl No	IEMs	E-mail id
1	Ms. Alka Sirohi, IAS (Retd)	Email: <a href="mailto:alka.sirohi@gmail.com">alka.sirohi@gmail.com</a>
2	Shri. Sunil Kumar Chourasia, IOFS (Retd.)	Email: <a href="mailto:sunilchourasia@hotmail.com">sunilchourasia@hotmail.com</a>

- 31.2 In the event of any dispute between the management and the contractor relating to those contracts where Integrity Pact is applicable, in case, both the parties are agreeable, they may try to settle dispute through mediation before the panel of IEMs in a time bound manner. The fees / expenses on dispute resolution shall be equally shared by the both the parties.
- 31.3 Curriculum Vitae of Independent External Monitors (IEMs) are placed permanently on the home page of MRPL's website [www.mrpl.co.in](http://www.mrpl.co.in) -Tenders.

Note:

“Any routine request for tender enquiry, bid extension etc. should not be generally forwarded to IEMs unless the Bidder/vender is aggrieved/unsatisfied with any action(s) of MRPL For details of Role and functions of IEM MRPL CVC website may be referred or use the link below”.<https://cvc.gov.in/sites/default/files/circular%20no.06-05-21.pdf>

## 32.0 **HOLIDAY LISTING POLICY:**

- 32.1 The Guidelines and procedures for Holiday Listing are available in MRPL website as Holiday Listing Policy and shall be applicable in the context of all tenders and consequently all Orders / Contracts / Purchase Orders. This can be accessed at URL [www.mrpl.co.in](http://www.mrpl.co.in) .refer to Tenders - Holiday Listing Policy.
- 32.2 Agencies participating in tenders are deemed to have read, accepted and agreed for the Holiday Listing Policy of MRPL and shall not seek any damages/compensation from MRPL on account of the Holiday Listing of business with the Agency.

## 32.3 **DECLARATION:**

Any party or its associated company if had been in the holiday list / black-listed/ banned by any Central/ State Government agencies or any Central / State PSU



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company or any Regulatory Institution/Authority and such name appears in the list of the above mentioned central / state Government agencies or central / state PSUs or any Regulatory Institution/Authority as on date is disqualified and would not be considered.

**An affidavit to this effect/ or an affidavit that the vendor is not holiday listed / black listed / banned by above mentioned Agencies is required to be produced, if called for by MRPL, in the event of award of work order.**

Agency (Bidder) has to declare and undertake that MRPL has unconditional right to terminate the contract which is already awarded or yet to be awarded to the Agency if it is put under holiday listing.

### **33.0 PREFERENCE TO PUBLIC SECTOR ENTERPRISES / MSE**

Price preference shall not be applicable for this tender (being Works Contract services) as per prevailing Govt. of India guidelines

### **34.0 OWNER'S RIGHT TO ACCEPT OR REJECT ANY BID**

- I. Owner reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or Bidders or without any obligation to inform the affected Bidder or Bidders of the grounds or the reasons for Owner's action.
- II. In the opinion of Owner, if the total price or certain item rates quoted by the Lowest Bidder are considered high, he may invite the Lowest Bidder for price negotiation. Lowest Bidder shall attend such negotiation meetings and if requested by Owner shall provide the analysis of rates/break-up of amount quoted by him for any or all items of Schedule of Rates to demonstrate the reasonability. As a result of negotiation, Bidder may offer rebate on his earlier quoted price.

### **35.0 CONTRACT AGREEMENT**

The CONTRACTOR shall execute a formal contract with OWNER within 30 days from the date of issue of Letter of Acceptance, on a non-judicial stamp paper of Rs.200/- value. The cost of non-judicial stamp paper shall be borne by the CONTRACTOR. Contract documents for agreement shall be prepared after the acceptance of bid. Until the final contract documents are prepared and executed, this Bidding Document together with the annexed documents, modifications, deletions agreed upon by the OWNER and bidder's acceptance thereof shall constitute a binding contract between the successful Bidder and the OWNER based on terms contained in the aforesaid documents and the finally submitted and accepted prices.

The Contract document shall consist of the following:


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- a) Form of Contract on non-judicial stamp paper
- b) Original Bidding Document.
- c) Amendment to Bidding Document issued, if any.
- d) Fax/ Letter of Acceptance.
- e) Detailed Letter of Award (DLOA) along with enclosures.

**36.0 E-PAYMENTS**

Owner has initiated payments to suppliers and contractors electronically and to facilitate the payments electronically, the bidder should have an account with Banks supporting the same so that the payment through e-banking be made to the bidder, in case work is awarded to him. The payment shall be released either through Electronic Clearing System (ECS) / Electronic Fund Transfer (EFT)/ Real Gross Time Settlement (RGTS) or through Internet. The bidder should give their Bank details as per FORM-L attached with Proposal Form, to facilitate payment through E-banking.

**37.0 TRANSPORTATION :**

Contractor shall be responsible to arrange transportation (to and fro) to MRPL for his workforce at his own cost.

**38.0 PUTTING UP OF BUILDINGS ON PROJECT SITE (If applicable) :**

The contractor shall put up temporary structures as required by him for his office fabrication shop and stores only on the area allocated to him on the Project Site. No tea stalls/canteens should be put up or allowed to be put up by contractor in plant area without written permission of the owner.

No Person other than authorised watchman shall be allowed to stay in the plant area after completion of the days work without prior written permission of the Engineer-in-charge

**39.0 GENERAL GUIDELINES (As applicable)**

- 39.1 Every tenderer must quote strictly in accordance with the conditions and specifications prescribed by MRPL. Special conditions (if any) submitted along with the tender documents by the bidder will not be applicable to this Tender, in case they are in conflict with any of our terms and conditions.
- 39.2 All entries in the tender must be written in permanent ink or typewritten without use of eraser or overwriting. Corrections if any, should be attested under the full signature of the Bidder.
- 39.3 All tenderers are required go through the GCC carefully and submit a declaration statement as token of having read, understood and accepted the conditions, along with information called for by MRPL.
- 39.4 Company will not be responsible for loss or late /non-receipt of tender documents.
- 39.5 MRPL reserve the right to assess bidder's capability and capacity to execute the work using in-house information and by taking into account other aspects such as concurrent commitments and past performance, etc.
- 39.6 Submission of authentic/genuine documents is the prime responsibility of the


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bidder. Wherever MRPL has concern or apprehension regarding the authenticity/genuineness of any document, MRPL reserves the right of obtaining the documents cross verified from the document issuing authority.

- 39.7 MRPL reserve the right to complete the evaluation based on the details furnished by the bidder in the first instance along with their bid without seeking any additional information.
- 39.8 Bidder should have independent ESI & PF code allotted by Employee State Insurance Corporation and Employees Provident Fund Organization. The details should be enclosed along with the technical bid. However, in the event of non-availability of PF code at the time of submitting the bid, the successful bidder shall obtain the same within 45 days from the date of commencement of the work and an undertaking to this effect shall be enclosed.
- 39.9 The wages paid by the contractor to their employees / workmen shall be fair and in no case be less than the wages prescribed by the appropriate Government under the Minimum Wages Act, 1948 and all provisions of Regulation of Contract Labour Act. In addition to the minimum wages prescribed by the appropriate government/authorities, the successful bidder shall pay employer contribution of PF, ESI, Leave wages, Bonus as per bonus act, MRPL special allowance as per clause provided. All safety gadgets, Uniform shall be given to the employees by the bidder as per F&S Dept requirements.
- 39.10 All tenderers are required to give details in the Performa attached (Appendix-V, VI & VII) and attach to Technical bid.
- 40.0 DIFFERENCE IN MEANINGS/TERMS:** In case of any difference of any of the terms and conditions either in the meaning or understanding or contradictory terms or conditions at different places/portions in this document, the more stricter terms favouring MRPL will apply. The bidder shall also seek clarifications on such issues from MRPL before submission of the quotes.
- 41.0 CORRECTNESS OF DOCUMENT:**  
It shall be understood that every endeavour has been made to avoid error which can materially affect the basis of this tender and the successful tenderer shall take upon himself and provide for risk of any error which any subsequently be discovered and shall make no subsequent claim on account thereof no advantage is to be taken by the tenderer successful Or otherwise of any clerical error of mistake which may occur in the general specification, schedules, plans of tender forms supplied to the tenderer.
- 42.0 BID VALIDITY :**
- 42.1 The rate quoted against this tender shall be valid for a period as mentioned in the NIT (as specified in from the date of opening of tenders and once the quotation is accepted and order placed on the successful tenderers, the rate shall be valid for the full period of the contract (INCLUDING THE EXTENDED PERIOD, IF OPTED BY MRPL).
- 42.2 Tenderers are requested to carefully study the entire tender document and the conditions so specified before quoting their rates, no alteration in the tender rates quoted will be allowed.





### 43.0 RIGHT OF OWNER TO ACCEPT OR REJECT TENDER:

43.1 The right to accept the tender will rest with the OWNER. The OWNER, however, does not bind himself to accept the lowest tender, and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever. At the option of the Owner, the work for which the tender had been invited, may be awarded to one Contractor or split between more than one bidders, in which case the award will be made for only that part of the work, in respect of which the bid has been accepted. The quoted rates should hold good for such eventualities. Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed conditions are not fulfilled are liable to be rejected. The Tender containing uncalled for remarks or any additional conditions are liable to be rejected. Canvassing in connection with tenders is strictly prohibited and tenders submitted by the Tenderers who resort to canvassing will be liable to rejection.

### MSEs & STARTUP COMPANIES

#### 44.0 CONDITIONS FOR MICRO AND SMALL ENTERPRISES (MSEs)

1. As per Public Procurement policy (PPP) for Micro & Small Enterprises (MSEs) Order, 2012 issued vide Gazette Notification dated 23.03.2012 by Ministry of Micro, Small and Medium Enterprises of Govt. of India, MSEs must be registered with any of the following in order to avail the benefits / preference available vide Public Procurement Policy MSEs Order, 2012.
  - a) District Industries Centers (DIC)
  - b) Khadi and Village Industries Commission (KVIC)
  - c) Khadi and Village Industries Board
  - d) Coir Board
  - e) National Small Industries Corporation (NSIC)
  - f) Directorate of Handicraft and Handloom
  - g) Any other body specified by Ministry of MSME (MoMSME)
  - h) Udyog Aadhaar Acknowledgment / Udyog Aadhaar Memorandum issued by MoMSME.

MSEs participating in the tenders must submit valid & authorized copy of certificate of registration with any one of the above agencies. In case of bidders submitting DIC registration certificate, he shall attach original notarized copy of the DIC certificate.

2. The MSEs registered with above mentioned agencies /bodies are exempted from payment of Earnest Money Deposit (EMD).
3. Bidder shall be Manufacturer for supply items  
As per the MoMSME, the benefits of the PP Policy extended only to manufacturers registered under this and are not applicable to traders/ dealers/resellers/ distributors/authorized agents etc. Accordingly, the eligible MSE bidders shall be registered for the item tendered.


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Bidder shall submit proof that he is a manufacturer of the item for which he is quoting and he shall highlight the details of his manufacturing status in the MSE certificate against the item he is proposing to bid in the tender. However, in cases where installation / commissioning and related activities along with Purchase of item(s)is/are involved and the bidder has relevant MSE certification, then he shall be eligible for claiming benefits of the PP Policy.



4. The registration certificate issued must be valid as on Bid closing date of the tender. Bidder shall ensure validity of registration certificate in case bid closing date is extended.
5. The MSEs who have applied for registration or renewal of registration with any of the above agencies/bodies, but have not obtained the valid certificate as on close date of the tender, are not eligible to avail benefits under PP Policy. Where validity of such certificates such as NSIC certificate has lapsed, it shall be the responsibility of the bidder to seek renewal from the concerned Govt agency before such expiry. Documentary evidence seeking extension before the lapse of validity of such certificate and an authorization letter from the Govt. agency having received application for renewal shall be submitted before the bid closing date.
6. MRPL being a critical refinery installation, vital to public safety and maintaining essential supplies to the society and other customers including Govt agencies, reserves right to grant relaxation in tender conditions under the Public Procurement Policy on procurement of goods and services from Micro and Small Enterprises (MSEs) order 2012/other Government guidelines as applicable from time to time.

- 45.0 **Purchase Preference for Micro and Small Enterprises: Deleted - Not applicable**
- 46.0 **CONDITIONS FOR START-UP COMPANIES -----Deleted -Not applicable**
- 47.0 **POLICY TO PROVIDE PURCHASE PREFERENCE (LINKED WITH LOCAL CONTENT) (PP-LC) & ANNEXURE-I---- Refer SCC**
- 48.0 **BANK GUARANTEE(BG) VERIFICATION UNDER THE “STRUCTURED FINANCIAL MESSAGING SYSTEM” (SFMS).**

The irrevocable Bank Guarantee (BG) in the following prescribed format if submitted against Earnest Money Deposit/PBG/SD/Mobilisation advance shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).



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A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary's 'Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited



**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925 **SWIFT Code:** UBININBBMAP **MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

#### **49.0 TERMS AND CONDITIONS FOR BIDDERS FROM A COUNTRY SHARING LAND BORDERS WITH INDIA.**

- I. The Department of Expenditure (Ministry of Finance) of the Govt. Of India through OMs no. 6/18/2019- PPD dated 23<sup>rd</sup> July and 24<sup>th</sup> July'2020 has issued guidelines regarding procurement from bidders from a country or countries which share land boundary with India. The detail guidelines are available on the website of DoE (<https://doe.govin/>).
- II. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority specified in Annexure I of the DoE OM dated 23.07.2020 (attached for reference). The Competent authority for the purpose of registration shall be the Registration Committee constituted by the Department of Promotion of industry & internal Trade (DPIIT) of Govt. of India.
- III. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- IV. "Bidder from a country which shares a land border with India" for the purpose of this Order means:-
  - a) An entity incorporated, established or registered in such a country; or
  - b) A subsidiary of an entity incorporated, established or

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registered in such a country; or



- c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
- d) An entity whose beneficial owner is situated in such a country; or
- e) An Indian (or other) agent of such an entity; or
- f) A natural person who is a citizen of such a country; or
- g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

V. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

**Explanation-**

- a) "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company,
  - b) "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or votings agreements.
2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
  3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
  4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;



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5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

- VI. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
- VII. In tenders for Works Contracts, including Turnkey contracts- The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.
- VIII. Bidder mandatorily requires to submit “Certificate of Compliance” in the enclosed Form : A. This certificate need to be submitted in the Company’s Letter Head and should be sealed and signed by the authorized signatory on behalf of the bidder. None submission of Form A may lead to disqualification for Techno- Commercial evaluation of the submitted bid. (Refer Form B in case of Works Contract). In case at any stage pre or post order placement it is found that that the certification furnished is false their bid shall be summarily rejected or order terminated as applicable. MRPL may at its discretion initiate penal action against such bidders which may include Black Listing Holiday Listing the party /encashment of EMD or PBG submitted as per contractual provision etc.
- IX. Compulsory submission of Valid Registration Certificate from Competent Authority is required as and when a party claims to have registered themselves with the Competent Authority or else bid shall be rejected without evaluation.
- X. Wherever Tenders are floated Registration with Competent Authority should be valid at the time of submission of Bid and at the time of acceptance and evaluation of bids / LOA or Order Placement. In case where tender is not floated registration should be valid at the time of placement of Order. A Bidder who is validly registered at the time of acceptance / placement of order in such cases valid registration will not be a relevant consideration during contract execution.

**Note I:**For better clarity and to obtain information in detail bidders are requested to go thru the Govt Circular issued by the Department of Expenditure Govt of India to this effect.

**Note II:**For information on Exclusion from restriction under Rule 144 (xi) of the GFR, 2017 and Special Cases for exemption under the purview of this policy, bidders are requested to refer to the Govt Circular & Annexures therein accordingly.

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**Special Note:** It is the responsibility of the Bidders to keep themselves updated over any revisions or changes in conditions mentioned in this circular. For all practical purpose the latest applicable circular will be considered for this tender as published by the Govt time to time.



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**FORM A**

**BIDDER'S UNDERTAKING**

(On Company's Letter Head)

To,

Mangalore Refinery & Petrochemicals Limited  
Mangaluru, Karnataka.

Sub: Certificate of Compliance

Bidder's Details :

Name of the Tender

: \_\_\_\_\_

Tender No

: \_\_\_\_\_

We/ I have read carefully the clause regarding restrictions on procurement from a bidder of a country which shares land boundary with India attached with this Tender Document and hereby certify that M/s. \_(Name of the Company/ Bidder) is :-

A. Not from such a country and is eligible to be considered for evaluation : YES / NO (\*)

B (i) If from such a country but is registered with the Competent Authority : YES/NO (\*)

C (ii) If from such a country valid Registration Certificate from  
Competent Authority is submitted with the bid : YES / NO

(\*)

I as the authorized signatory on behalf of the bidder certify that the company fulfils all the criteria stipulated in the Govt OM and is eligible to be considered for this tender.

(\*) : Tick Yes / No whichever is applicable.

Place :



Signature :

Date :

Name :

Designation

: Seal of the  
Company :

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**FORM B**

**BIDDER'S UNDERTAKING IN CASE OF WORKS CONTRACT**

(On Company's Letter Head)

To,

Mangalore Refinery & Petrochemicals Limited  
Mangaluru, Karnataka.

Sub: Certificate of Compliance

Bidder's Details:

Name of the Tender

: \_\_\_\_\_

Tender No

: \_\_\_\_\_

We / I have read carefully the clause regarding restrictions on procurement from a bidder of a country which shares land boundary with India attached with this Tender Document and on sub-contracting to contractors from such countries and hereby certify that M/s. \_\_\_\_\_ (Name of the Company/ Bidder) is :-

- A. Not from such a country and is eligible to be considered for evaluation : YES / NO (\*)  
 B. If from such a country but is registered with the Competent Authority: YES/NO (\*)  
 C. If from such a country valid Registration Certificate from Competent  
 a. Authority is submitted with the bid : YES / NO (\*)

M/s. \_\_\_\_\_ (Name of the Company) certify that we will not sub-contract any work to a party/ contractor from such countries unless they are registered with the Competent Authority.

I as the authorized signatory on behalf of the bidder certify that the company fulfils all the criteria stipulated in the Govt OM and is eligible to be considered for this tender.

(\*) : Tick Yes / No whichever is applicable.

Place:

Signature :

Date:

Name :

Designation

: Seal of the  
Company :



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FORM C

**BIDDER'S UNDERTAKING (For Transitional Cases)**

(On Company's Letter Head)

To,

Mangalore Refinery & Petrochemicals Limited  
Mangaluru, Karnataka.

Sub: Certificate of Compliance

Bidder's Details:

Name of the Tender

: \_\_\_\_\_

Tender No

: \_\_\_\_\_

We/I have read carefully the clause regarding restriction on procurement from a bidder of a country which shares land boundary with India attached with this tender document and hereby certify that M/s.

\_\_\_\_\_ (Name of the Company) is not from such a country and is eligible to be considered.

We/I do solemnly resolve to submit valid registration certificate from Competent Authority as applicable in case any such requirement arises for evaluation and acceptance of bid purpose.

Place:

Signature :

Date:

Name :

Designation

: Seal of the  
Company :





## 50.0 VULNERABILITY ATLAS OF INDIA

Vulnerability Atlas of India (VAI) is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT-wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation stage.



This Atlas is one of its kind single point source for the various stakeholders including policy makers, administrators, municipal commissioners, urban managers, engineers, architects, planners, public etc. to ascertain proneness of any city/location/site to multi-hazard which includes earthquakes, winds, floods, thunderstorms, cyclones and landslides. While project formulation, approvals and implementation of various urban housing, buildings and infrastructures schemes, this Atlas provides necessary information for risk analysis and hazard assessment.

The Vulnerability Atlas of India has been prepared by Building Materials and Technology Promotion Council under Ministry of Housing and Urban Affairs, Government of India and available at their website [www.bmtpc.org](http://www.bmtpc.org).

It is mandatory for the bidders to refer Vulnerability Atlas of India for multi-hazard risk assessment and include the relevant hazard proneness specific to project location while planning and designing the project in terms of:

- i) Seismic zone (II of V) for earthquakes
- ii) Wind velocity (Basic Wind Velocity: 55, 50, 47, 44, 39 & 33 m/s)
- iii) Area liable to floods and Probable max. surge height
- iv) Thunderstorms history
- v) Number of cyclonic storms / severe cyclonic storms and max sustained wind specific to coastal region
- vi) Landslides incidences with Annual rainfall

normal District wise Probable Max. Precipitation

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## PROPOSAL FORMS

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FORM-A

**FORM OF BID**

(TO BE GIVEN ON BIDDER'S LETTER HEAD)

**FORM OF TENDER**

(To be filled up by the Tenderer)

For Commercial Bid

Serial No.

Date:

From

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To

Mangalore Refinery and Petrochemicals  
Limited Mangalore

Tender No. \_\_\_\_\_

Dear Sirs,

Having examined the Tender Documents consisting of the Tender Notice, General Instructions to Tenderers, General Conditions of Contract, Special Instructions to Tenderers, Special conditions of Contract, Specifications, Plans (Exhibits\_\_\_\_to \_\_\_\_\_), Drawings (Exhibits \_\_\_\_\_to \_\_\_\_\_) Time Schedule, Form of Contract, Form of Schedule of rates, and Addendum (a) to the Tender Documents, and having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of Mangalore Refinery and Petrochemicals Limited, relative to the work tendered for in connection with the \_\_\_\_\_ (Name of the Refinery/Project) and having conducted a thorough study of the job site(s) involved, the site conditions, soil conditions, the climatic conditions, labour , power, water, material and equipment availability, the transport and communication facilities, the availability and suitability of borrow areas, the availability of land for right of way and temporary office accommodation and quarters and all other facilities and things whatsoever necessary for or relative to the formulation of the tender of the performance of work, I/we hereby submit my/our tender offer for the performance of proposed work in accordance with the terms and conditions and within the time mentioned in the Tender Documents.

In consideration of the sum of Rupee 1/- (Rupee one) only paid to me/us by Mangalore

Tender no: 3200000590

Bidder's Seal & Signature


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Refinery and Petrochemicals Limited, by adjustment in the price of Tender Documents, I We further undertake to keep my/our this tender offer open for a period of not less than 4 (four) months from the schedule date of opening of Tenders as specified in the General Instructions to Tenderer forming part of the Tender Documents:

I/ We hereby further state that I/We/None of us (in the case of partnership firm) and none of our Directors (in the case of a Company) was/were employed as Directors of Mangalore Refinery and Petrochemicals Limited, during the period of 2(two) years immediately preceding the date hereof OR I/We hereby declare that I/Shri\_\_\_one of our partners (in case of partnership firm/Directors in the case of a company) was employed as a Director in Mangalore Refinery and Petrochemicals Limited, during the period of 2 (two) years immediately preceding the date hereof and

that I/Shri \_\_\_\_\_have/has obtained previous permission of Mangalore Refinery and Petrochemicals Limited, to make this tender.



I/We have annexed to this Bid the following documents:

- (i) Schedule of Rates in the prescribed form - mention QUOTED for all line items in FORM SP-0.
- (ii) Preamble to Price schedule
- (iii) Schedule of Rates in the pre-filled FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4.
- (iv) Original Power of Attorney or other proof of authority of the person who has signed the Tender OR copy of Power of Attorney attested by a Gazetted Officer or a Notary Public in proof of authority of the person who has signed the Tender.
- (v) Original Income-tax clearance certificate OR copy of Income-Tax Clearance certificate duly attested by Gazetted Officer/Notary Public.
- (vi) Information regarding tenderer in the form annexed to the Form of Tender.
- (vii) Information regarding experience of the tenderer in the performance of work of a comparable nature in the form annexed to the Form of Tender.
- (viii) Information regarding construction organization and equipment in the form annexed to the Form of Tender.
- (ix) Solvency Certificate from a Nationalized/Scheduled bank.
- (x) Set of Tender Documents including all amendments/addendums/corrigendum as issued duly signed and stamped
- (xi) Additional Documents as listed below.

I/We hereby undertake that the statements made herein/information given in the Annexures referred to above are true in all respects and that in the event of any such statement or information being found to be incorrect in any particular, the same may be construed to be a misrepresentation entitling Mangalore Refinery and Petrochemicals Limited, to avoid any resultant contract.

I/We further undertake as and when called upon by Mangalore Refinery and Petrochemicals Limited to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

I/We confirm having deposited earnest Money of Rs. \_\_\_\_\_(Rupees\_\_\_\_\_ ) as

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detailed hereunder (Strike off whichever is not applicable).

(Signature(s) of the  
Tenderer(s)) Name & Designation of  
Authorized person Singing the Tender on  
behalf of The Tenderer(s) Full Name and  
address of the Bidder(s)

Witness:  
Signature  
Name:  
Occupation  
:

Name & Designation of Authorized  
person Singing the Tender on behalf of The  
Tenderer(s) Full Name and address of the  
Bidder(s)

Witness:  
Signature  
Name:  
Occupation  
:



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**FORM OF TENDER**

(To be filled up by the Tenderer)

**For Price Bid**

Serial No.

Date:

From

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To

Mangalore Refinery and Petrochemicals  
Limited Mangalore

Tender No. \_\_\_\_\_

Having examined the Tender Documents consisting of the Notice inviting Tender, General Instruction of Tenderer, General Conditions of Contract, Special Instructions to Tenderers, Special Conditions of Contract, specifications, plans, drawings, time-schedule, form of Contract, form of tender, form of Schedule of Rates and Addendum (s) to Bidding Document having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of Mangalore Refinery And Petrochemicals Ltd., relating to the work tendered for in connection with the construction of

..... (Name of Refinery/ Project , Mangalore”, and having conducted a thorough study of the job site(s) involved, the site conditions, soil conditions, the climatic conditions, labour, power, water, material and equipment availability, the transport and communication facility, the availability and suitability of borrow areas, the availability of land for right-of-way and temporary office and accommodation quarters and all other factors and facilities and things whatsoever necessary or relative to the formulation of the tender and the performance of work. I/We hereby submit our tender offer for the performance of the proposed work in accordance with the terms and conditions and within the time mentioned in the Tender Documents at the rate(s) quoted by me/us in the accompanying schedules of rates based on the form of schedule (s) of Rates included within the Tender documents and arrived at a Total Contract Value of **(as quoted in E-tendering Portal)** based on an application of the rates tendered in the accompanying Schedule(s) of Rates to the relative quantities indicated in the form of Schedule (s) of Rates forming part of the Tender Documents.

If the work or any part thereof is awarded to me/us, I/We undertake to perform the work in accordance with the contract document as defined in Form of contract forming part of the Tender Documents and accept the terms and conditions of Contract as laid down therein,

**Tender no: 3200000590**

**Bidder's Seal & Signature**


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and undertake within 10 (ten) days of receipt of Acceptance / Award of Tender to pay to and/or deposit with the Accounts Officer, Mangalore Refinery And Petrochemicals Ltd., Mangalore, a sum which, together with the amount of Earnest Money deposited by me/us in terms hereof, shall make Rupees .....

(Rupees.....) as specified in the Acceptance / Award of Tender for the purpose of security deposit, by any one or more of the modes of payments specified in the general conditions of contract, and to commence work at each job site(s) involved within 10 (ten) days of handing over the job site or any part thereof to me/us, and to sign, the formal contract in terms of the form of contract forming part of Tender Documents, within 10 (ten) days of receipt of Letter of Acceptance / Award from or on behalf of Mangalore Refinery And Petrochemicals Ltd., in this behalf failing which Mangalore Refinery and Petrochemicals Ltd., shall be at liberty, without further reference to me/us and without prejudice to any of its rights or remedies, to terminate the contract and/or to forfeit the Earnest Money deposited in terms hereof.



In consideration of the sum of Rupee 1/- (Rupee one only) paid to me/us by Mangalore Refinery And Petrochemicals Ltd., by adjustment in the price of Tender Documents, I/We further undertake to keep my/our this tender offer open for a period of not less than 4/6 (four/six) months from the Schedule date of opening of Tender as specified in the General Instructions to tenderers forming part of the Tender Documents.

I/We hereby further state that I/We/None of us (in the case of partnership firm) was/were employed as Directors of Mangalore Refinery And Petrochemicals Ltd., during the period of 2 (two) years immediately preceding the date hereof or I/We hereby declare that I/Sri....., one of our partners in the case of a partnership firm, was employed as a Director in the Mangalore Refinery And Petrochemicals Ltd. during the period of 2 (two) years immediately preceding the date hereof and that I/Sri ..... have/has obtained previous permission of Mangalore Refinery And Petrochemicals Ltd., to participate in this tender.

I/We have annexed to this tender the following documents:

- (i) Schedule of Rates in percent ( plus/minus) in the prescribed FORM SP-0
- (ii) Original Power of Attorney or proof of authority of the person who has signed the Tender OR copy of Power of Attorney or duly attested by a Gazetted Officer in proof of authority of the person who has signed the tender;
- (iii) Original Income-tax Clearance certificate OR copy of Income-tax Clearance Certificate duly attested by a Gazetted Officer;
- (iv) Original Sales Tax Clearance Certificate OR copy of Sales-tax Clearance Certificate duly attested by a Gazetted Officer;



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- (v) Information regarding tenderer in the form annexed to the Form of Tender;
- (vi) Information regarding experience of work of a comparable nature in the form annexed to Form of Tender;
- (vii) Information regarding construction organization and equipment in for form annexed to the Form of Tender;
- (viii) Solvency Certificate from a Nationalized/Scheduled Bank;
- (ix) Set of Tender Documents, as issued duly signed;
- (x) Any additional documents as listed below;

I/We hereby undertake that the statements made herein and the information given in the Annexures referred to above are true in all respects and that in the event of any such statement or information being found to be incorrect in any particular, the same may be construed to be mis-representation entitling Mangalore Refinery And Petrochemicals Ltd.to avoid any resultant contract.

I/We further undertake as and when called upon by Mangalore Refinery And Petrochemicals Ltd., to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

I/We confirm having deposited Earnest Money of Rs.....(Rupees.....) as detailed hereunder: (strike-off whichever is not applicable.)

By Demand Draft No..... Dated..... Drawn.....  
Bank..... Branch .....attached hereto)

Dated this ..... day of..... 2020.

Yours faithfully,

Signature(s) of the Tenderer (s)



Witness (Signature):

Name in block letters:

Address:

Occupation:

Name and designation of authorised person signing the tender on behalf of the tender (s). Full name and address of the tenderer(s).

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FORM -A1

**INFORMATION ABOUT TENDERER**

(To be furnished with Tender)

1. In case of Individual
  - 1.1 Name of Business:
  - 1.2 Whether his business is registered:
  - 1.3 Date of Commencement of business:
  - 1.4 Whether he pays Income Tax over Rs.10,000/- per year:
  - 1.5 Whether he is a Director or is related to any Director of MRPL present or retired within the past 2 years.
  - 1.6 Permanent Account Number:
  - 1.7 What are his profits/losses for the past 3 (three) years with a copy of Balance Sheet and Profit & Loss Account for the past 3 (three) years with a copy of the audited balance Sheets and Profit & Loss account for the past 3 (three) years:
  - 1.8 What are his concurrent job commitments:
  - 1.9 How does he propose to finance the work if awarded to him:
  
2. In case of Partnership
  - 2.1 Name of Partners:
  - 2.2 Whether the partnership is registered:
  - 2.3 Date of establishment of firm:
  - 2.4 If each of the partner of the firm pays Income tax over rs.10,000/- a year and if not, which of them pays the same:
  - 2.5 Whether any partner of the firm is a Director of MRPL present or retired within the past 2 years.
  - 2.6 Permanent Account Number:
  - 2.7 What are the firm's profits/losses for the past 3 (three) years with a copy of Balance Sheet and Profit & Loss Account for the past 3 (three) years:
  - 2.8 What are the firm's concurrent job commitments:
  - 2.9 How does the firm propose to finance the work if awarded to him:
  
3. In case of Limited Company or Company Limited by Guarantees:
  - 3.1 Amount of paid up capital:
  - 3.2 Name of Directors:
  - 3.3 Date of registration of Company:
  - 3.4 Copies of the Balance Sheet of the company of the last two years:
  - 3.5 Whether any of the Directors of the Company is a Director or is related to any Director of MRPL present or retired within the past 2 years.
  - 3.6 Permanent Account Number:
  - 3.7 What are the Company's profits/losses for the past 3 (three) years with a copy of the audited Balance Sheet for the past 3 (three) years
  - 3.8 What are the company's concurrent job commitments:
  - 3.9 How does the Company propose to finance the work if awarded to it:





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NOTE: Reference is also invited to Clause 9.0 of General Instruction to the Tenderers forming part of GCC.

Signature of Tenderer  
Name & Address of the Tenderer

	<p style="text-align: center;"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <p style="text-align: center;"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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FORM-A2

### Proforma for Earnest Money Deposit

The irrevocable Bank Guarantee (BG) in the following prescribed format if submitted against Earnest Money Deposit shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s ‘Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka  
**IFSC code:** UBIN0905925  
**SWIFT Code:** UBININBBMAP  
**MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

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### PROFORMA OF BANK GUARANTEE

(FOR EARNEST MONEY DEPOSIT AS APPLICABLE)  
 (On non-judicial paper of appropriate value)

To  
 Mangalore Refinery and Petrochemicals  
 Limited Mangalore

Dear Sirs,

In consideration of Mangalore Refinery and Petrochemicals Limited , having its Registered Office at Kuthethoor P.O Via Katipalla , Mangalore - (hereinafter called “the Owner” which expression shall include its successors and assigns), having agreed interalia to consider the tender of ..... (Name of the Tenderer) having its Head Office/Registered Office at ..... (Address of the Tenderer) (hereinafter called the “Tenderer” which expression shall include its successors and


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assigns), for the work of..... (Name of the Project/ Work) at.....  
to be awarded under Tender No Upon the Tenderer furnishing an undertaking from the Bank as hereinafter appearing in lieu of cash deposit of the Earnest Money.

We ..... (Name of the Bank), a Bank Constituted/Registered under the ..... Act, having our Head Office/Registered Office at ..... (hereinafter called the “Bank” which expression shall include its successors and assigns), at the request of the Tenderer and with the intent to bind the Bank and its successors and assigns do hereby unconditionally and irrevocably undertake to pay the Owner at Mangalore forthwith on first demand without protest or demur or proof or satisfaction or condition and without reference to the Tenderer, all sums payable by the Tenderer as and by way of Earnest Money to the Owner, upto an aggregate limit of (Amount in figures and words).

**AND THE BANK DOTH HEREBY FURTHER AGREES AS FOLLOWS:**

1. This Guarantee/Undertaking shall be a continuing guarantee and shall remain in full force and effect for all claims or demands made by the Owner on the Bank until the Owner discharges this Guarantee/Undertaking subject, however, that the Owner shall have no claims under this Guarantee/Undertaking after the midnight of .....200..... or any written extension(s) thereof.  
PROVIDED that if the aforesaid work tendered for or any part thereof shall be awarded to the Tenderer on or before the said date, whether on the basis of accompanying tender or any other basis, then the validity of this guarantee/undertaking shall stand automatically extended for all claims and demands made by the Owner for further three months.  
The Owner shall have the fullest liberty without reference to the Bank and without affecting in any way the liability of the Bank under this Guarantee/Undertaking at any time and/or from time to time any wise to postpone and/or vary any of the powers, rights, and obligations exercisable by the Owner against the Tenderer and either to enforce or to forbear from enforcing all or any of the terms and conditions of or governing the said Tender and/or any contract consequent upon any award of work or the said Earnest Money Deposit or the securities available to the Owner or any of them and the Bank shall not be released from its liability under these Presents and the Liability of the Bank
2. hereunder shall remain in full force and effect notwithstanding any exercise by the Owner of the liberty with reference to any or all the matters aforesaid or by reason of any other act, matter or thing whatsoever which under law relating to the sureties or otherwise which could, but for this provision have the effect of releasing the Bank from all or any of its obligations hereunder or any part thereof, and the Bank specifically waives any and all contrary rights whatsoever.
3. It shall not be necessary for the Owner to proceed against the Tenderer before proceeding against the Bank and the Guarantee/Undertaking herein contained shall be enforceable against the Bank as principal debtor notwithstanding the existence of any other undertaking or security for any indebtedness of the Tenderer to the Owner and notwithstanding that any such security shall at the time when claim is



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made against the Bank or proceedings taken against the Bank hereunder, be outstanding or unrealised.

4. The amount stated by the Owner in any demand, claim or notice made with reference to this guarantee shall as between the Bank and the Owner for the purpose of these Presents be conclusive of the amount payable by the Bank to the Owner hereunder.
5. The liability of the Bank to the Owner under this Guarantee/Undertaking shall remain in full force and effect notwithstanding the existence of any difference or dispute between the Tenderer and the Owner, the Tenderer and the Bank and/or the Bank and the Owner or otherwise howsoever touching these Presents or the liability of the Tenderer to the Owner, and notwithstanding the existence of any instructions or purported instructions by the Tenderer or any other person to the Bank not to pay or for any cause withhold or defer payment to the Owner under these Presents, with the intent that notwithstanding the existing of such difference, dispute or instructions, the Bank shall be and remain liable to make payment to the Owner in terms thereof.
6. This Guarantee/Undertaking shall not be determined or affected by the liquidation or winding up or dissolution or change of constitution or insolvency of the Tenderer or any change in the legal constitution of the Bank or the Owner.
7. Without prejudice to any other mode of service, a demand or claim or other communication may be transmitted by the Owner to the Bank either by post or by fax. If transmitted by fax, the transmission shall be complete as soon as acknowledged by the Bank.
8. Notwithstanding anything contained herein:
  - i) The Bank's liability under this guarantee/undertaking shall not exceed (Amount in figures & words);
  - ii) The guarantee/undertaking shall remain in force upto\_\_\_\_\_ and any extension(s) thereof; and
  - iii) The Bank shall be released and discharged from all liability under this guarantee/undertaking unless a written claim or demand is issued to the Bank on or before\_\_\_\_\_ or the date of expiry of any extension(s) thereof if this guarantee/undertaking has been extended.

The Bank doth hereby declare that Shri \_\_\_\_\_ (designation) \_\_\_\_\_ who is authorised to sign this Guarantee/Undertaking on behalf of the Bank and to bind the Bank thereby.

This \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_.

Yours faithfully

Signature: \_\_\_\_\_

Name & Designation: \_\_\_\_\_

Name of the branch: \_\_\_\_\_



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**FORM-B1**

**FORMAT FOR SPECIFIC WORK MEETING THE EXPERIENCE**

**CRITERIA (AS APPLICABLE IN NIT)**



Bidder shall furnish their Experience for similar work with all details and documents as mentioned in this Specific Experience Format which are in conformity with Bidder's Qualification Criteria mentioned in Notice Inviting Tender .In case of more than one work, furnish details for all such Works.

S.NO.	DESCRIPTION	DETAILS
<b>Details of similar works executed by bidder(Complying the requirement of BQC)</b>		
1.	Name of Project and its location	
2.	Description of work	
3.	Name of Owner, Postal Address, Phone/Fax No./E-mail Address	
4.	Name of Consultant, Postal Address, Phone/ Fax No./E-mail Address	
5.	Contract Value: (a)Awarded  (b)Final Executed  (c) Component of relevant work experience asper BQC.	Rs. _____  Rs. _____  Rs. _____
	<b>Milestone Dates</b>	<ul style="list-style-type: none"> <li>• Date of award: _____</li> <li>• Starting date: _____</li> <li>• Scheduled Completion Date: _____</li> <li>• Actual Completion Date: _____</li> <li>• Reasons for delay, if any:</li> </ul>






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	DESCRIPTION	DETAILS
6.	Supporting Documents for Experience Criteria	<ul style="list-style-type: none"> <li>Whether copy of Work Order/Contract Agreement enclosed</li> </ul> <p>YES                  NO</p> <p>Ref.no. _____</p> <p>Dated _____</p> <ul style="list-style-type: none"> <li>Whether Completion Certificate enclosed</li> </ul> <p>YES                  NO</p> <p>Ref. No.: _____</p> <p>Dated _____</p> <p>Date of Completion _____</p>
7.	Supporting Document for Financial Criteria	<ul style="list-style-type: none"> <li>Whether Complete Annual Audited Financial Report Including P&amp; L account is enclosed.</li> </ul> <p>YES                  NO <input type="checkbox"/></p> <p>If Yes, submitted for financial years</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p>
8.	Whether Worked as Contractor directly with Client or Sub-contractor of Contractor	<p>Executed the work as</p> <ul style="list-style-type: none"> <li>Main Contractor</li> <li>Sub-contractor <input type="checkbox"/></li> </ul>

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9.	In case of Subcontractor, the relevant certificates/documents submitted as per NIT	<ul style="list-style-type: none"> <li>• Submitted</li> <li>• Not Submitted</li> </ul> <p>If submitted then reference number.....</p>
10.	CONFIRMATIONS	BIDDER'S CONFIRMATION
10.1	Confirm that the above work has been completed within the qualifying period as mentioned in NIT	Confirmed

10.2	Confirm that the above work is not an In-housework experience.	Confirmed
10.3	Confirm that the information/documentation furnished in this proforma are correct and in case of any original document is required by Owner/MRPL the same shall be submitted for Verification.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Confirmed <input type="checkbox"/>
10.4	Confirm that all information/documentation for the work to be considered for qualification is Furnished in this proforma along with supporting documents as detailed NIT. Non submission of above required information/documentation may lead to rejection of bid	Confirmed
10.5	Confirm the submission of following Formats/Certificates, as applicable towards fulfilment of Bidder Qualification Criteria:  (i) Statutory Document  (ii) Notarized document	<p>If Yes, (Please tick mark / the applicable)</p> <p>YES                      NO</p> <p>YES                      NO</p>

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<b>10.6</b>	<p>Confirm that all documents furnished by the bidder in support of meeting the experience &amp; financial criteria of BQC have been duly certified by the Statutory Auditor of the bidder or a practicing Chartered Accountant (not being an employee or a Director or not having any interest in the bidder's company/ firm) where audited accounts are not mandatory as per law or Notarized by a Public Notary in bidder's Country or self-certified by CEO or CFO or Company Secretary of the bidder (Limited company only) as per the provision of NIT.</p>	<b>Confirmed</b>

Note: Bidder to use separate format for different works.

**SIGNATURE OF BIDDER :**

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**NAME OF BIDDER :**

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**COMPANY SEAL :**

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ANNEXURE TO FORM-B1

DELETED

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**FORM - B2****ANNUAL TURNOVER STATEMENT**

The bidder shall indicate herein his annual turnover during preceding 3 years based on the audited balance sheet/profit & loss account statement.

**A. FINANCIAL DETAILS**

S.NO.	FINANCIAL YEAR/ YEAR ENDING	ANNUAL TURNOVER (RS.)
1	Year 1 (20 - 20 )	
2	Year 2 (20 - 20 )	
3	Year 3 (20 - 20 )	
NET WORTH OF IMMEDIATE PRECEDING YEAR AS PER AUDITED FINANCIAL RESULT		
WORKING CAPITAL OF IMMEDIATE PRECEDING YEAR ASPER AUDITED FINANCIAL RESULT		

**NOTES:**

- i) **Net worth** means paid up share capital, Share Application Money pending allotment\* and reserves# less accumulated losses and deferred expenditure to the extent not written off.  
# Reserves to be considered for the purpose of net worth shall be all reserves created out of the profits and securities premium account but shall not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.

\*Share Application Money pending allotment will be considered only in respect of share to be allotted.

Accordingly, the definition of Net worth shall be as follows:

Paid up share capital



Add: Share Application Money pending allotment Add: Reserves (As defined Above)

Less: Accumulated Losses

Less: Deferred Revenue Expenditure to the extent not written off Net worth

- ii) **Working Capital calculation:** Working Capital shall be Current Assets minus Current Liabilities

**(Sign & Stamp of Bidder)**

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FORM-C

**COMPLIANCE TO BID REQUIREMENT**

**NAME OF WORK:**.....

**BIDDING DOC. NO.:**.....



We hereby agree to fully comply with, abide by and accept without variation, deviation or reservation all technical, commercial and other conditions whatsoever of the Bidding Documents and Amendment(s) / Addendum(s) to the Bidding Documents, if any, for subject work issued by MRPL.

We here by further confirm that any terms and conditions if mentioned in our bid (Un-priced as well as Priced Part) shall not be recognized and shall be treated as null and void.

**SIGNATURE OF BIDDER:**

**NAME OF BIDDER:**

**COMPANYSEAL:**

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FORM-D (Sheet 1 of 2)

## EXCEPTIONS AND DEVIATIONS (FOR COMMERCIAL PART)

SL.NO	REFERENCE OF BID DOCUMENT		SUBJECT	DEVIATIONS
	PAGE NO.	CLAUSE NO.		



NOTE: This shall be submitted separately for Commercial &amp; Technical Sections

SIGNATURE OF BIDDER:

NAME OF BIDDER:

COMPANY SEAL:



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FORM-D (Sheet 2 of 2)

**EXCEPTIONS AND DEVIATIONS (FOR TECHNICAL PART)**

SL.NO	REFERENCE OF BID DOCUMENT		SUBJECT	DEVIATIONS
	PAGE NO.	CLAUSE NO.		



NOTE: This shall be submitted separately for Commercial &amp; Technical Sections

SIGNATURE OF BIDDER:

NAME OF BIDDER:

COMPANY SEAL

\_\_\_\_\_



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**FORM-E****CHECKLIST FOR SUBMISSION OF BID**

Bidder is requested to fill this check list and ensure that all details/ documents have been furnished as called for in the Bidding Document along with duly filled in, signed & stamped check list with each copy of the "Unpriced bid (Part-I)".



**Please tick the box and ensure compliance:**

- |   |                          |
|---|--------------------------|
| (1) Form of Bid as per<br><br>FORM-A Submitted  | <input type="checkbox"/> |
| (2) Power of Attorney in favour of the person who<br>as signed the bid.<br><br>Submitted  | <input type="checkbox"/> |
| (3) Information about Bidder as per<br><br>FORM-A1 Submitted  | <input type="checkbox"/> |
| (4) EMD<br><br>Submitted  | <input type="checkbox"/> |
| (5) EMD details<br><br>DD No: _____<br>BG No: _____<br>Dated: _____<br>Amount: _____<br>Validity: _____<br>Name & Address of issuing<br>bank:<br><br>_____                      |                          |
| (6) Registered under Micro or Small<br>Enterprise Development Act 2006 and<br>claiming exemption From payment of<br>EMD?<br><br>If yes, copy of NSIC/ DIC / UAM<br>registration | Yes /<br>No              |

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Certificate uploaded Submitted/Not Submitted/Not Applicable

- (7) Integrity Pact (If Required as per Bidding Document)
- Submitted
- (8) Documentation against Bidder meeting the BQC (Technical & Commercial) stipulated in NIT per FORM-B1 & B2 and as per NIT
- (a) Submitted
- (b) Not Submitted
- (9) Compliance to Bid Requirement as per FORM-C. Submitted
- (10) Exceptions / Deviations as per FORM-D both technical and commercial Part (Un-priced) Submitted
- (11) Reply to commercial questionnaire as per FORM-F with Bidder's Reply/ confirmation for each Sl. Nos. Submitted
- (12) Details of PF as per FORM-G Submitted
- (13) Employees Provident Fund Registration Certificate Submitted / Not Submitted /Not applicable
- (14) If EPF Registration is not available, duly acknowledged (by the EPF Authorities) copy of application or undertaking on Bidder's Submitted/ Not Submitted
- Company letterhead for obtaining the same in case of award/Not available of contract
- PF Code No: \_\_\_\_\_
- (15) ESI obtained from the Competent Authority Submitted / Not Submitted /Not applicable

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- (16) If ESI No is not available, duly acknowledged (by ESI Authority) copy of application or Undertaking on Bidder's Company letterhead for obtaining the same in case of award of contract
- Submitted / Not Submitted / Not available

ESI No: \_\_\_\_\_



- (17) Declaration by the Bidder as per FORM-J Submitted
- (18) Declaration about current litigation/arbitration Submitted
- (19) Blank copy (without price) of Price Part Submitted
- (20) MOU/AOA/Partnership Deed Submitted
- (21) Declaration by Bidder regarding Blacklisting / Holiday listing Submitted, if Applicable
- (22) Undertaking for non-engagement of child labour as per FORM-K Submitted
- (23) Bidder's Bank Details as per FORM-L Submitted
- (24) Reply to Technical questionnaire (if enclosed in technical part) with Bidder's Reply/Confirmation for each Sl. No. Submitted (If applicable)
- (25) Technical Details/Documents specified in Technical part Submitted (If applicable)
- (26) Cancelled cheque of bidders bank account Submitted
- (27) Copy of PAN Card Submitted
- (28) Letter of Waiver as per Form-N Submitted

**CONFIRM THE FOLLOWING**

- (1) All pages of the bid have been page numbered in sequential Manner YES
- (2) Master Index and Copy of Addendum/ Amendment, if any,

Has been submitted along with offer, duly signed and stamped on each page. YES

- (3) Blank copy (without price) of Price bid duly signed and stamped On each page has been

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submitted. YES

- (4) The bid has been submitted in line with requirements as specified in Instructions to Bidders YES

SIGNATURE OF BIDDER : \_\_\_\_\_

NAME OF BIDDER : \_\_\_\_\_

COMPANYSEAL : \_\_\_\_\_

 <b>ONGC</b> एन.ओ.एन.सी.एल. <b>MRPL</b>	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	 <b>nauvata</b> ENGINEERING CONSULTANTS
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL          REFINERY, MANGALORE, KARNATAKA          VOLUME I : COMMERCIAL</b>	

FORM-F



**COMMERCIAL QUESTIONNAIRE**

Bidder's reply/ confirmation as furnished in the Commercial Questionnaire (CQ) shall supersede the stipulations mentioned elsewhere in their bid.

SL.NO.	MRPL'S QUERY	BIDDER'S REPLY/ CONFIRMATION
1.0	Confirm that your Bid is valid for 120 days months from the last date of submission of Bid.	
2.0	Confirm that EMD/Indemnity Bond (as applicable) as per bid stipulations have been furnished along with bid.	
3.0	Confirm that the following documents are submitted with Part-I:	
a)	All documents as per Form- E (CHECKLIST) & Clause 9.5 of ITB.	
b)	Master Index as enclosed with NIT is submitted in unpriced part duly signed and stamped on each page.	
c)	Copy of Addendum/ Amendments as a token of acceptance (Applicable, if issued).	
4.0	Confirm that price has been submitted in an e-tender portal as per the manner stated in the ITB.	
5.0	Schedule of Rates/Price	
a)	<b>Price must be filled in the Price bid Form uploaded in the e-tender portal. Please note that the format is not to be edited /altered by the bidder.</b>	
b)	Confirm that rate/price has been quoted for all items of SOR.	
c)	Confirm that deviation/terms & conditions are not mentioned in the price part. In case any terms and condition is mentioned in the price part, the same shall be treated as null and void.	
6.0	Confirm your compliance to TERMS AND CONDITIONS of Bidding Document .Confirm your compliance to critical stipulations of bidding document as mentioned in SITB.	



Tender No: 3200000590

Bidder's Seal &amp; Signature

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SL.NO	MRPL'S QUERY	BIDDER'S REPLY/ CONFIRMATION
7.0	Confirm that you have studied complete Bidding Document including Technical and Commercial part and your Bid is in accordance with the requirements of the Bidding Document.	
8.0	Confirm your compliance to total Scope of Work mentioned in the Bidding Document	
9.0	Confirm your acceptance for 'Scope of Supply' mentioned in the Bidding Document and confirm that all materials shall be supplied as per Standards and Specification.	
10.0	Confirm your acceptance for Time Schedule as mentioned in Bidding Document.	
11.0	Confirm that your quoted price includes all taxes & duties as applicable for this Work in accordance with the provision of General Conditions of Contract (GCC) and Special Conditions of Contract (SCC).	
12.0	Confirm that your quoted price includes all types of insurance as per the provisions of GCC and SCC.	
13.0	Confirm that all costs resulting from safe execution of Work, such as safety practices, use of protective clothing, safety glasses and helmet, safety precaution taken during monsoon, or any other safety measures to be undertaken by the Contractor for execution of work are included in the quoted rates	
14.0	Confirm that while submitting your price, you have taken consideration of scope of supplies, scope of work and technical requirement mentioned in Bidding Document	
15.0	Confirm that you have your own QA/QC programme for executing this work. In case of award of work, you will submit all QA/QC documents as per specification.	





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	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL          REFINERY, MANGALORE, KARNATAKA          VOLUME I : COMMERCIAL</b>	

16.0	We confirm that we are not involved in any Litigation or Arbitration. OR We confirm that the current litigation/ arbitration in which We are involved will not have any impact in work being tendered or in entering into contract during the validity of offer and performing the contract till all contractual Obligations under contract are performed.	
------	--	--

17.0	Confirm that the Bidder is not under liquidation, court receivership or similar proceedings.	
------	--	--



SL. NO.	MRPL'S QUERY	BIDDER'S REPLY/ CONFIRMATION
18.0	Confirm Compliance to the following: Minimum required equipment's, tools & tackles to be mobilized as required. ii) Key Construction Manpower to be deployed at site as per SCC.	
19.0	Please confirm that your Bid does not have any deviation to terms and conditions of the Bidding Document.	
20.0	Confirm that you have uploaded the Bid on e-tender portal as per the instructions given in ITB.	
21.0	None of the Directors of BIDDER is a relative of any Director of Owner or the BIDDER is a firm in which any Director of Owner or his relative is a Partner or the BIDDER is a private company in which none of director of Owner is a member or Director.	
22.0	Confirm that all authenticated documents submitted for meeting the BQC are certified as per the authentication requirement defined in the bidding document.	
23.0	Bidder to confirm the submission of the following : a) Bank Guarantee for PBG upon Placement of Order.  b) Bank Guarantee for Mobilisation Advance, if applicable.	<input type="text"/>  <input type="text"/>

**SIGNATURE OF BIDDER:** \_\_\_\_\_

	<p>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</p> <p>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</p>	
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NAME OF BIDDER : \_\_\_\_\_

COMPANY SEAL : \_\_\_\_\_

	<p style="text-align: center;"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <hr/> <p style="text-align: center;"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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FORM- G

**DETAILS OF P.F. REGISTRATION**

Bidder to furnish details of Provident Fund Registration:

PF Registration No. :



District & State:

We hereby confirm that the above PF Account is under operation presently and shall be used for all PF related activities for the labour engaged by us in the present work (if awarded to us).

**SIGNATURE OF BIDDER :**

**NAME OF BIDDER :**



**COMPANYSEAL :**

	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE	
	PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL	

**FORM - H****BIDDER'S QUERIES (TECHNICAL)**

SL. NO.	BIDDING DOCUMENT		SUBJECT	BIDDER'S QUERY	OWNER'S REPLY
	PAGENO.	CLAUSENO.			

**NOTE:** Bidder's Queries may be sent by e-mail to: [gmpai@mrpl.co.in](mailto:gmpai@mrpl.co.in)  
 Submit the queries one day prior to the Pre-bid meeting



	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

FORM-I

**BIDDER'S QUERIES (COMMERCIAL)**

SL. NO.	BIDDING DOCUMENT		SUBJECT	BIDDER'S QUERY	OWNER'S REPLY
	PAGENO.	CLAUSENO.			

**NOTE:** Bidder's Queries may be sent by e-mail to: [gmpai@mrpl.co.in](mailto:gmpai@mrpl.co.in)  
Submit the queries one day prior to the Pre-bid meeting

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

FORM-J

**DECLARATION BY THE BIDDER**

We (Name of the Bidder) here by represent that we have gone through and understood the Bidding Document (which is in two Parts) in Commercial Part (including Price)) and Technical Part and that our Bid has been prepared accordingly in compliance with the requirement stipulated in the said documents.

We are submitting Master Index of Bidding Document as part of our Bid, duly signed and stamped on each page in token of our acceptance. We undertake that Commercial Part (including Price) and Technical Part of the Bidding Document shall be deemed to form part of our bid and in the event of award of work to us, the same shall be considered for constitution of Contract Agreement. Further, we shall sign and stamp each page of above Parts of Bidding Document as a token of Acceptance and as a part of the Contract in the event of award of Contract to us.



We further confirm that we have indicated prices in Schedule of Rates (Short Description), which is print out of Short Description of SOR with prices, considering detailed description of items given in Schedule of Rates (Detailed Description) including Summary of Price and submitted in Price Bid in separately sealed envelope. We confirm that price quoted by us includes price for all works/activities/supply etc. as mentioned in item description of the items in Schedule of Rates (with detailed tem description) which has been issued to us in CD (PDF File) or downloaded as per the Bidding Document.

**SIGNATURE OF BIDDER** : \_\_\_\_\_

**NAME OF BIDDER** : \_\_\_\_\_

**COMPANYSEAL** : \_\_\_\_\_

**NOTE:** This declaration should be signed by the Bidder's representative who is signing the Bid.

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

**FORM-K****UNDERTAKING FOR NON-ENGAGEMENT OF CHILD LABOUR****Name of Work:****Bidding Doc. No.:****I/we hereby declare that:**

- a) We are committed to elimination of child labour in all its forms.
- b) Neither we nor any of our nominated sub-contractor(s) are engaging Child Labour in any of our work(s) in terms of the provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable laws.
- c) We as well as our nominated sub-contractor(s) undertake to fully comply with provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable labour laws, in case the work is awarded to us.
- d) It is understood that if / We, either be for re award or during execution of Contract, commit at transgression through violation of Article b/c above or in any other form, such as to put my/our reliability or credibility in question, the Owner is entitled to disqualify us from the Tender process or terminate the Contract, if already execute do reclude me /us from future contract award processes .The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Owner. Such exclusion may be for a period of 1 year to 3 years as per the procedure prescribed in the guidelines for holiday listing of the Owner.
- e) I/We accept and undertake to respect and uphold the Owner's absolute right to resort to and impose such exclusion.

Place:



Signature of Bidder:

Date:

Name of Signatory

**Tender No: 3200000590****Bidder's Seal & Signature**





	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	
<b><u>FORM-L</u></b>		

### **VENDOR FORM FOR ELECTRONIC FUNDS TRANSFER PAYMENT & TAX DETAILS**



Please use additional copies of this form if your Company has additional Branches/ divisions dealing with MRPL/ if Material/ Service/ Invoice will be provided from different GST Nos.

**Vendor data - ver-9**

<b>To:</b>	<b>GGM - Materials</b>	
	<b>Mangalore Refinery &amp; Petrochemicals Ltd., Kuthethoor P.O., via Katipalla, Mangalore.</b>	
	<b>(Karnataka), Pin Code-575030, INDIA</b>	
	The following is a confirmation/ updation of our bank account details and I/we hereby affirm our choice to opt for payment of amounts due to us under various contracts through electronic mode.	
<b>1. Vendor/ Contractor particulars:</b>		
(i)	Name of the Company:	
(ii)	Corporate Identity No. (CIN)	
(iii)	Existing Vendor Code (given by MRPL)	
(iv)	Complete Postal Address:	
(v)	Pin code/ ZIP code:	
(vi)	Telephone nos. (with country/area codes):	
(vii)	Fax No.: (with country/area codes):	
(viii)	Cell phone Nos.:	
(ix)	Contact persons /Designation:	
(x)	Email IDs:	
<b>2. Bank Account Particulars:</b>		
(i)	Name of the Account holder:	
(ii)	Complete Bank Account No. (for Electronic Funds Transfer):	
(iii)	Account type :	
(iv)	Bank Name :	
(v)	Bank Branch:	
(vi)	Bank Branch Contact Nos.:	
(vii)	11 Digit IFS Code (for Bank Branches in India)	
(viii)	Swift Code (for Bank Branches not in India)	
<b>3. Tax Registration numbers: *(Please fill in the applicable fields and attach relevant proofs)</b>		
(i)	Income Tax PAN no.:	
(ii)	Vendor type as per GST Act (tick any one)	
(iii)	GST No.:	
(iv)	TAN No.:	
(v)	Registered address as per GST No.	
(vi)	Contact Names, Nos.& email IDs for GST matters (Please mention primary and secondary contacts):	
	Accounts Deptt.	1. 2.
	Material Dispatch Deptt./ Services Deptt.	1. 2.
(vii)	Are you registered under TReDS	No/Yes with RXIL/ A-TREDS/M1xchange 10 digit Reg No-

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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<b>4. Organization information (MSMEs refer to Micro, Small and Medium Enterprises Development Act, 2006):</b>	
(i)	Company /Partnership Firm /Proprietary Concern / Society/Trust /NGO/Others (Please Specify):
(ii)	Whether Proprietor/ Partner belongs to SC/ ST category. (Please specify names and percentage of shares held by SC/ST Partners):
(iii)	Micro/Small / Medium Enterprise/ SSI/ Govt. Deptt./ PSU/ Others:
(iv)	Name of MSME Registering Body (NSIC/ DIC/ KVIC/KVIB etc.):
(v)	MSME Registration no. (with copy of registration)
(vi)	UdyogAadhaar Memorandum no.
(vii)	MSME-Women Entrepreneur ) No/Yes
(viii)	Start-Up recognized by DIPP, Ministry of Commerce, Govt of India ) No/Yes, copy of certificate from DIPP attached
<b>I/we hereby confirm that the particulars given above are correct and complete and also undertake to advise any future changes to the above details.</b>	
<b>Name, Seal &amp; Signature of Authorized Signatory for the Vendor with date</b>	
<b>TO BE FILLED BY AUTHORISED BANKER OF THE VENDOR:</b>	
<b>Certified that the Particulars as in Sr. No. 2 above are correct as per our records</b>	
<b>Bank Seal &amp; Signature with date</b>	

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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**FORM-M1****INTEGRITY PACT**

between

Mangalore Refinery and Petrochemicals Ltd (MRPL) hereinafter referred to as "The Principal", and

M/s ..... hereinafter referred to as "The Bidder/Contractor"

**Preamble**

The Principal intends to award, under laid down organizational procedures, contract/s for procurement of products / services vide tender No. ....dtd The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.



In order to achieve these goals, the Principal will appoint an Independent External Monitor (IEM) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

**Section 1 - Commitments of the Principal**

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
1. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  2. The Principal will, during the tender process treat all Bidders with equity and reason. The principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any bidder confidential/additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.
  3. The Principal will exclude from the process all known prejudiced persons.
- (2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance officer and in addition can initiate disciplinary actions.

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 For "The Principal"

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 For "The Bidder/Contractor"

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

### Section 2 - Commitments of the Bidder(s)/Contractor(s)

- (1) The Bidder(s) / Contractor(s) commit themselves to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commit themselves to observe the following principles during his participation in the tender process and during the contract execution.
1. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
  2. The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartellization in the bidding process.
  3. The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
  4. The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/ Contractor(s), Further, as mentioned in the Guidelines all the payments made to the Indian agent/ representative have to be in Indian Rupees only.
  5. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
  6. Bidder(s)/Contractor(s) who have signed the Integrity Pact shall not approach the courts while representing the matter to IEMs and shall wait for the decision in the matter.
- (2) The Bidder / Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

### Section 3 - Disqualification from tender process and exclusion from future contracts



If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Policy for Holiday Listing". Copy of the "Policy for Holiday Listing" is placed at MRPL Website.

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For "The Principal"

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For "The Bidder/Contractor"

**Tender No: 3200000590**

**Bidder's Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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#### Section 4 - Compensation for Damages

- (1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit / Bid Security.
- (2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee.

#### Section 5 - Previous transgression

- (1) The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or Action can be taken as per the procedure mentioned in "Policy for Holiday Listing".

#### Section 6 - Equal treatment of all Bidders / Contractors / Subcontractors

- (1) In case of Joint Venture, all the partners of the Joint Venture should also sign the integrity pact. In case of sub- contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub- Contractor. It is to be ensured that all sub-contractors also sign the Integrity Pact.
- (2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors & Subcontractors.
- (3) The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

#### Section 7 - Criminal charges against violating Bidders / Contractors / Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion this regard, the Principal will inform the same to the Chief Vigilance Officer.



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For "The Principal"

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For "The Bidder"

**Contractor Section 8 - Independent Monitor External Monitor**

**Tender No: 3200000590**

**Bidder's Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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- (1) The Principals appoints competent and credible independent external Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- (2) The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all contract documents, whenever required. It will be obligatory for him/ her to treat the information and documents of the Bidders/ Contractors as confidential. He/She reports to the Managing Director, MRPL.
- (3) The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors.
- (4) The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s)/ Sub-Contractor(s) with confidentiality. The monitor has also signed declarations on 'Non- Disclosure of Confidential Information' and of 'Absence of Conflict of Interest.' In case of any conflict of interest arising at a later date, the IEM shall inform Managing Director, MRPL and rescue himself/ herself from that case.
- (5) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- (6) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- (7) The Monitor will submit a written report to the Managing Director, MRPL within 8 to 10 weeks from the date of reference or intimation to him by the 'principal' and, should the occasion arise, submit proposals for correcting problematic situations.
- (8) If the Monitor has reported to the Managing Director MRPL, a substantiated suspicion of an offence under IPC/PC Act, and the Managing Director MRPL has not, within reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.
- (9) The word "Monitor" would include both singular and plural.



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 For "The Principal"

Contractor Section 9 - Pact Duration

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 For "The Bidder"

Bidder's Seal & Signature

Tender No: 3200000590

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Managing Director of MRPL.

### Section 10 - Other Provisions

- (1) This agreement is subject to Indian Law, Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Mangalore.
- (2) Changes and supplements as well as termination notices need to be made in writing. Side Agreements have not been made.
- (3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- (4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- (5) Issues like Warranty/ Guarantee etc. shall be outside the purview of IEMs.
- (6) In the event of any contradiction between the Integrity Pact and its Annexure, the clause in the Integrity Pact will prevail.

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For "The Principal"

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For "The  
Bidder/Contractor" (Name  
& Signature with Seal)



Place: Mangalore

Witness 1:.....

Date:.....

Witness 2:.....



	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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**FORM-M2**

FORMAT FOR FURNISHING AFFIDAVIT W.R.T. INTEGRITY PACT

**FORMAT OF AFFIDAVIT**

AFFIDAVIT OF..... S/o D/o ....., resident of  
 .....  
 EMPLOYEDAS..... WITH  
 .....HAVING OFFICE AT.....  
 .....  
 .....PIN .....

I, the above named deponent do hereby solemnly affirm and state as under:-

1. That I am the authorized representative and signatory of M/s .....
2. Bidding entity M/s \_\_\_\_\_ is not involved in any case of transgression in terms of Integrity Pact Submitted for tender No 3200000590
3. I depose accordingly,

**DEPONENT**

**VERIFICATION**

I, the deponent above named, do hereby verify that the factual contents of this Affidavit are true and correct. No part of it is false and nothing material has been concealed there from.



Verified at on this ..... day of .....  
 20.....

**DEPONENT**

(on non-judicial stamp paper of appropriate value & duly notarized)

**Tender No: 3200000590**

**Bidder's Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

**ORM-N****FORMAT OF LETTER OF WAIVER**

(ON LETTERHEAD OF BIDDER)

Name of Work: -----

Bidding Document No :-----

We \*hereby agree to fully comply with, abide by and accept without variation, deviation or reservation all technical, commercial and other conditions whatsoever of the tender documents of Tender no and all Addenda issued by MRPL.

We further hereby waive, withdraw and abandon any and all deviations, variations, objections or reservations whatsoever thereto here to-before set out, given or indicated in our offer, clarifications, correspondence, communications, or otherwise with a view that the price bid submitted may be treated to conform in all respects, with the terms and conditions of the said tender documents including all Addenda.



We further hereby confirm that the price quoted in the price bid is as per the provisions of the tender document and there is no deviation to the provisions in the price bid.

\*\* For &amp; on behalf of

Authorised signatory of Bidder

\* Here fill in the name of bidder.

\*\* The Letter of Waiver must be signed by the person(s) authorised to sign

	<p style="text-align: center;"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <hr/> <p style="text-align: center;"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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FORM- P

(TO BE GIVEN ON BIDDER'S LETTER HEAD)

**PROFORMA OF DECLARATION OF BLACK LISTING/HOLIDAY LISTING**In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s.\_\_\_\_ which is submitting the accompanying Bid/Tender nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a Managing Partner have been placed on black list or holiday list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

In the case of a Partnership Firm:

We hereby declare that neither we, M/s.\_\_\_\_\_, submitting the accompanying Bid/Tender nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern have or has been placed on blacklist or holiday list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

In the case of company:

We hereby declare that we have not been placed on any holiday list or black list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")



It is understood that if this declaration is found to be false in any particular, Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry, shall have the right to reject my/our bid, and if the bid has resulted in a contract, the contract is liable to be terminated.

Signature of Bidder\_\_\_\_\_

Name of Signatory: \_\_\_\_\_

Place: Date:

**Tender No: 3200000590****Bidder's Seal & Signature**

	<p><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <p><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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**FORM- P1**

We hereby declare that we have not been blacklisted by any Government Department/ Public Sector on date of submission of bid), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

For & on behalf of

Authorised signatory of Bidder

	<p><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <p><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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**FORM-Q**

(ON LETTERHEAD OF BIDDER)



We confirm that we are not involved in any Litigation or Arbitration.

OR

We confirm that the current litigation/ arbitration in which we are involved will not have any impact in work being tendered or in entering into contract during the validity of offer and performing the contract till all contractual Obligations under contract are performed.

For & on behalf of



Authorised signatory of Bidder

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

**FORM-R****STATEMENT OF CREDENTIALS**



Tenderers should fill their technical offer by providing all information as follows (If not applicable-  
Please mention as 'N/A')

SI No	Particulars	Details
1	Name of the Firm	
2	Nature of the Firm (State whether Limited Company, partnership Firm, Co-op. Society or Sole Proprietor, Photocopies of documents Confirming constitution of the firm to be Enclosed)	
3	Year of Establishment	
4	Registration Number, if any	
5	Registered Postal Address	
6	Telegraphic Address, if any	
7	Telephone No. (s)	
8	Fax No. (s), if any	
9	E-mail ID, if any	
10	Address of Branches, if any	
11	Address on which Order /LOA to be placed	
12	Name of Directors/ partners / Proprietor (as The case may be) with address & Telephone No.(s).	
13	Permanent Income Tax No.	
14	Last Income Tax Clearance (Attach Photocopy)	
15	Name of Bankers & Branch with full address	
16	Type of Account & A/C No.	

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17	Name (s) of Authorised Representatives (s)  Note : Power of Attorney signed by the Director(s)/ Partners / Proprietor in favour of the authorized Person signing the tender documents must be enclosed.	
18	Type of job in which engaged as independent manufacturer contractor	
19	Maximum value of the Job the Contractor/ manufacturer is capable of Handling per year. (Furnish details of your Financial standing together with the Bank References and necessary Solvency certificate From their banker (Nationalised) as per Bank's Format).	
20	Were you associated with MRPL in any Other contract in the past	
21	Are you currently having any contract with MRPL	
22	Are you on the approved list of other Oil Cos/ Public Sector Undertakings / govt. Dept. Etc. If so, furnish true copies of Certificates certifying your performance	
23	Please confirm that you have qualified/ trained / experienced staff on your payroll to handle this job	
24	Furnish Audited Balance sheet for last 3 Years ending previous financial year	
25	Details of technical collaboration. Please provide Documentary support (Xerox copies) if any and the brief experience of the parties.	
26	Confirmed that Bank Guarantee for acceptance of the Security Deposit as per tender will be provided	
27	Brief Description of the job methodology/Quality Assurance :	
28	Details of Testing methods and equipments that will be made available	



 <b>ONGC</b> एन.ओ.एन.सी.एल. <b>MRPL</b>	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>		 <b>nauvata</b> ENGINEERING CONSULTANTS
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL          REFINERY, MANGALORE, KARNATAKA          VOLUME I : COMMERCIAL</b>		
29	Details of your Past Experience in the country (India) in this nature of job.		
30	Whether the bidder is put on Holiday list of any of the PSU. (If sought later, an affidavit to be produced later to MRPL.)		



Bidder shall provide details in the below format, of at least one Authorised Contact person in Bidder's organization with whom MRPL may correspond on the matter for seeking any clarifications:

<b>1</b>	<b><u>Primary Contact Details of the Bidder</u></b>	
	Name	
	Designation	
	Landline Nos.	
	Cell Phone nos.	
	Email IDs	
<b>2</b>	<b><u>Alternate Contact Details of the Bidder</u></b>	
	Name	
	Designation	
	Landline Nos.	
	Cell Phone nos.	
	Email IDs	

**Note:** The Bidder to fill up the above and enclose along with Technical Bid.

**Authorized Signatory**

**(With Company Seal & Signature)**



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**FORM-S****DECLARATION FOR LIQUIDATION/COURT RECIEVERSHIP****(ON LETTERHEAD OF BIDDER)**

We confirm that we are not under Liquidation, Court Receivership or Similar Proceedings

For &amp; on behalf of

Authorised signatory of  
Bidder

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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**FORM-T****UNDERTAKING BY THE BIDDERS**

(In letter head)

Tender No: \_\_\_\_\_

Name of the Work: \_\_\_\_\_

We \_\_\_\_\_ (Name of the Tenderer) hereby certify that we have fully read and thoroughly understood all the tender requirements and accept all terms and conditions of the tender including all corrigendum / addendum / clarification issued, if any. Our offer is in confirmation to all the terms and conditions of the tender including all corrigendum / addendum / clarification, if any and minutes of the pre-bid meeting. In the event our offer is found acceptable and contract is awarded to us, the complete tender document shall be considered for constitution of Contract Agreement.

We confirm that we have quoted the rates in the tender considering inter-alia the

- 1) Tender Document(s)
- 2) Scope of Work / Special Conditions of Contract
- 3) Safety Policy
- 4) Pre-bid meeting Minutes (if any)
- 5) SOR / Price bid format
- 6) Corrigendum / Addendum/ Clarification (if any)



Place:

Signature of Bidder:

Date :

Name of Signatory:



**Note:** This declaration should be signed by the Tenderer's authorised representative on Company Letterhead who is signing the Bid and Scanned copy to be uploaded.

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**PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY,  
MANGALORE, KARNATAKA**



**TENDER NO. 3200000590**

**GENERAL CONDITIONS OF CONTRACT (GCC)**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

**GENERAL CONDITIONS OF CONTRACT**

SL.NO.	HEADING
1.	Section - 1: Definitions
2.	Section - 2: General
3.	Section - 3 : Materials, Labor & Equipment
4.	Section - 4 : Performance of Work
5.	Section - 5 : Inspection, Testing & Quality Assurance
6.	Section - 6 : Measurements & Payments
7.	Section - 7 : Termination
8.	Section - 8 : Miscellaneous
9.	Section - 9 ; Arbitration & Conciliation
10.	Section - 10 : Safety Code
11.	Appendix - I to General Conditions of Contract : Contractors' Labor Regulations
12.	Appendix - II to General Conditions of Contract : Model Rules for Labor Welfare
13.	Instructions to Tenderers
14.	Performa of Declaration of Blacklisting/Holiday Listing
15.	Equipment Questionnaire
16.	Experience Questionnaire
17.	Form of Tender (For Price Bid)
18.	Form of Tender (For Commercial Bid)
19.	Information about Tenderer
20.	Form of Contract
21.	Form of Bank Guarantee for Security Deposit/Performance Bond
21.	Form of Bank Guarantee for EMD
23.	Form of Bank Guarantee for Advance payment



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## SECTION - I

### DEFINITIONS



The following expressions hereunder and elsewhere in the Contract Documents used, unless repugnant to the subject or context thereof, shall have the following meanings hereunder respectively assigned to them, namely:

- 1.1.0.0 “Acceptance of Tender” shall mean the Acceptance of Tender issued by the OWNER to the CONTRACTOR, and shall include a letter, telegram or fax of acceptance or other notification of award of work, and a detailed Letter of Acceptance.
- 1.2.0.0 “Approval” shall mean the written and signed approval of the OWNER or of Engineer-in-Charge or Consultant authorized in this behalf by the OWNER, and with respect to a plan or drawing shall include an approval in Code 2, subject to the limitation(s) specified in such approval.
- 1.3.0.0 “Approval in Code 2” shall mean an approval to proceed with the work covered by plans or drawings subject to certain limitation(s) as specified in such approval.
- 1.4.0.0 The “Contract” shall mean the agreement between the parties as derived from the Contract Documents.
- 1.5.0.0 The “CONTRACTOR” shall mean Individual, Agency, Firm or Company (whether incorporated or not) selected by the OWNER for the performance of the Contract and shall include its legal representatives, successors and permitted assigns.
- The “Contract Documents” shall mean the contract documents as defined in Article I in the Form of Contract.
- 1.7.0.0 “Completion” or “Final Completion” shall mean the successful provision of all materials and inputs and the successful completion and conclusion of all activities required in all respects to complete the contractual works in accordance with the contract, but shall not include the obligation to rectify defects during the Defect Liability Period.
- 1.8.0.0 “Completion Certificate” shall mean the Completion Certificates issued by the Engineer-in-Charge in accordance with the provisions hereof.
- 1.9.0.0 “Commissioning” of a Plant or Unit shall mean pressing into service the unit(s), equipment(s), vessels, pipeline(s), machinery and systems and sub-systems comprising the Plant, in accordance with the approved Operation Manual and as per procedures recommended by the Designer/Process Licensor or Supplier thereof, and approved by the OWNER, after successful trial runs of the Plant/Unit.



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- 1.10.0.0 “Consultant” shall mean the Consultant appointed by the OWNER for the Project or the Works.
- 1.11.0.0 “Consumables” shall mean all items which are consumed in the execution of the Work, without being directly incorporated in the Work, such as fuel, electricity, water, POL, welding rods, electrodes and utilities.
- 1.12.0.0 “Defect Liability Period” shall mean the defect liability period as specified in the Contract.
- 1.13.0.0 The “Engineer-in-Charge” shall mean the Engineer or other officer of the OWNER Consultants or other organization for the time being nominated by the OWNER in writing to act as Engineer-in-Charge for the purpose of the Contract or any specific works.
- 1.14.0.0 “Final Certificate” shall mean the final certificate issued by the Engineer-in-Charge in accordance with the provisions hereof.
- 1.15.0.0 “General Manager” shall mean the Executive Director, General Manager or other Chief Executive (howsoever designated) of the Project to which the Contract relates, and if there is no such separate Chief Executive, shall mean the Executive Director (if any) or the General Manager, as the case may be, of Petrochemicals , Unit or Department of the OWNER to which the Project relates.
- 1.16.0.0 “Guarantee tests” shall mean all tests, undertaken after the Plant goes into operation and has stabilized, for ensuring that the functioning of the Plant meets all guarantees, as regards throughput, quality and magnitude/ quantity of output, at the final stage as well as at the stipulated interim stages of operation/process, as well as in respect of consumption of utilities, chemicals and catalysts, etc.
- 1.17.0.0 “Job Site” shall mean any site at which the work is to be performed by the CONTRACTOR, and shall include a part or portion of the job site.
- 1.18.0.0 “Manuals” shall mean the Erection and Installation Manual of the various equipment and machinery forming part of the Work(s) or Plant(s)/Unit(s) as well as the Operation and Maintenance Manuals thereof.
- 1.19.0.0 “Materials” shall mean all materials, plant, machinery, instruments, components, equipments, sub-assemblies and assemblies, parts, spares and other items or things required for permanent incorporation in the works.
- 1.20.0.0 “Mechanical Completion”, as applied to a Plant or Unit, shall mean the completion of civil works, erection, aligning and grouting of all mechanical and electrical equipment and piping, hydrostatic and other testing of all storage tanks, vessels, piping etc., all electrical and all utility connections to the equipment, mounting and fixing of all instruments, control systems and connecting them as required, testing and trial runs of all equipment on “no- load” and bringing the Plant to a state of readiness for pre-commissioning.
- 1.21.0.0 “Notified Claim” shall mean a claim of the CONTRACTOR notified in accordance with the provisions of Clause 6.6.1.0 hereof.





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- 1.22.0.0 “Order” and “Instruction” shall respectively mean any written Order or Instruction given by the Engineer-in-Charge or Site Engineer within the scope of their respective powers in terms of the Contract.
- 1.23.0.0 The “OWNER” shall mean Mangalore Refinery and Petrochemicals Limited, a company incorporated in India and having its registered office at Kuthethur, Katipalla, Mangalore- 575 030 and shall include its successors and assigns.
- 1.24.0.0 “Plans” and “Drawings” shall mean and include all technical documentation such as maps, sketches, designs, drawings, plans, details, charts, schedules, tracings, prints, computer outputs, printouts, and manuals, relating to the work forming the subject matter of the contract, including but not limited to those forming part of the Tender Documents, Offer Documents, and working drawings and details, together with amendments/alterations /revisions/modifications thereto, as may have been approved by and/or furnished by the OWNER, the Engineer-in-Charge and/or the Consultant, as well as “As- Built” drawings to be submitted by the CONTRACTOR as required under the contract.
- 1.25.0.0 “Pre-commissioning” shall mean the activities to be taken up before the taking up of Start- up, Commissioning and trial runs of the Plant/Unit, and shall include, without being limited to, all operations such as checking of all systems, subsystems, piping and vessels, flushing with air, water and steam, air-blowing and steam-blowing, system pressure and leak tests, purging with inert gas as required, checking all electrical equipment for earthing, resistances, operability tests and cold run on all operating equipment, vessels and systems individually and in combination, integration of all control systems with one another and with the main control system, and completion of all operation detailed under the head, “COMPLETION OF CONSTRUCTION” in API-700.
- 1.26.0.0 “Progress Schedule” shall mean the Progress Schedule established by the CONTRACTOR and approved by the Engineer-in-Charge for completion of the work(s) within the time schedule in accordance with the provisions hereof and failing such Progress Schedule, shall mean the Progress Schedule established by the Engineer-in- Charge in accordance with the provisions hereof.
- 1.27.0.0 “Performance Test(s)” shall mean all tests meant to ensure that the Plant(s)/ Unit(s) is/are in all respects in accordance with the requirements of the Contract and that the Plant functions properly and smoothly, in all respects as per the approved design parameters, within the permissible tolerances, and satisfy all the stipulated operating parameters, and will include the Guarantee Tests.
- 1.28.0.0 “Project” shall mean the project embracing the work(s) forming the subject matter of the Contract.
- 1.29.0.0 The “Site Engineer” shall mean the Engineer(s)/Officer(s) for the time being designated by the Engineer-in-Charge as his representative(s) in writing, and authorized by him to assist him in performing his duties and functions for the purpose of the Contract.

	<p align="center"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <p align="center"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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- 1.30.0.0 “Plant” or “Unit” shall mean the grouping of and assembly of systems, subsystems, machinery, equipment, piping and associated facilities, designed to function as a cognizable part of the Project Facility whether alone or in conjunction with other Plants/Units and Facilities. (Examples: Distillation Unit, Reformer Unit or Desulphurisation Unit).
- 1.31.0.0 “Schedule of Rates” or “Price Schedule” shall mean the Schedule of Rates or Price Schedule annexed to the Acceptance of Tender, and shall also include a lump sum price.
- 1.32.0.0 The “Specification(s)” shall mean the various specifications as set out in the Specifications forming part of the Tender Documents and as referred to and derived from the Contract and any order(s) or instruction(s) thereunder, and in the absence of any specifications as aforesaid covering any particular work or part or portion thereof, shall mean the Specifications and Codes of the Bureau of Indian Standards and other Organizations, including but not limited to British Standards Institution, ASTM, ASME, ANSI, API, AWS, AWWA, NACE HEI, IEC, IBR, IEEE, EIL, CPWD, etc. with such modifications as may be applicable for the particular part(s) of the Contract, as decided by the Engineer-in-Charge and as per Standard Engineering and Industry Practice and/or as directed by the Engineer-in-Charge.
- 1.33.0.0 “Security Deposit” shall mean the Security Deposit as specified in Clause 2.1.0.0 hereof and associated clauses there under.
- 1.34.0.0 “Subsystems” shall mean the further breakdown of a System into its subsections and sub-components, each designed to fulfill a precisely demarcated function or role in the working of the system. (Example: Demineralization of boiler feed water and fuel injection for boilers for the Steam Generation system).
- 1.35.0.0 “Start-up” shall mean all activities required to be performed after pre-commissioning and prior to trial operation and shall include final pre-commissioning inspection and check out of equipment, vessels and system(s) and supporting sub-system(s), initial operation of complete equipment and system within the Plant/Unit to obtain necessary pre-trial operation data, confirmation and correction of calibration, shutdown inspection and adjustment and other steps required to be taken prior to enable commissioning/trial operation.
- 1.36.0.0 “System” shall mean the breakdown of the Plant or Unit into specific sections and components; each designed to fulfill a precisely demarcated function or role in the working of the Plant/Unit (Examples: Fresh water system, circulating water system, steam and power generation and distribution system, fuel system, effluent system in a Power Plant).
- 1.37.0.0 “Time Schedule” shall mean the Time Schedule for final completion of the Works or Mechanical Completion of the Plant(s)/Unit(s) as the case may be, incorporated in the Contract or as may be extended by the OWNER or Engineer-in-Charge pursuant to the provisions hereof and shall include interim time schedules set up for achieving interim/phase-wise/stage-wise progress/completion/testing/commissioning/handing over, as may be prescribed by the OWNER/Engineer-in-Charge, within the overall Time Schedule as originally envisaged or as extended.

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- 1.38.0.0 The “Total Contract Value” shall, upto calculation of the entire remuneration due to the CONTRACTOR in terms of the contract on successful completion of the work, mean the Total Contract Value as specified in the Acceptance of Tender, and after calculation of the entire remuneration due to CONTRACTOR under the contract on successful completion of the contract, shall mean the total of such remuneration.
- 1.39.0.0 “Utilities” shall mean power, electricity, gas and other sources of energy, water, earth and other things whatsoever (other than materials and consumable(s)) required for or in the performance of the work(s).
- 1.40.0.0 “Work”, “Scope of Work”, “Service”, and “Scope of Services” shall mean the total work, services and activities to be performed or undertaken and the total responsibilities to be discharged, as envisaged by expression or implication in the contract and shall include all inputs required for such performance and discharge including (but not limited to) know- how, design/engineering inputs, preparation and supply of drawings and details, project management (including pre-construction activities, tendering, procurement, inspection and expediting), construction supervision, pre-commissioning, start-up and commissioning and supply of consumables, labour, construction and other requisite machinery and equipment, utilities and inputs required for, relative or incidental to and/or in connection with the performance of the contract upto completion (including testing, commissioning, handing over, troubleshooting, rectification, maintenance and defect liabilities).

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## SECTION - 2

### GENERAL

#### 2.0.0.0 INTERPRETATION OF CONTRACT DOCUMENTS:

2.0.1.0 Singular and Plural: Where the context so requires, words importing the singular also include the plural and vice versa.

2.0.2.0 Masculine and feminine: Where the context so requires, words importing the masculine gender shall also include the feminine gender and the neutral gender and vice versa.



2.0.3.0 Meanings: Unless expressly stipulated to the contrary in this contract: (i) the words “direction(s)/directed”, “instruction(s)/instructed,” “order(s)/ordered,” “requirement(s)/ required”, “permission(s)/permitted”, “approval(s)/ approved”, shall mean the written directions, instructions, orders, requirements, permissions or approvals, as the case may be, of the OWNER or of the Engineer-in-charge. (ii) The words “as felt”, “considered necessary”, “acceptable”, desirable” or “satisfactory”, shall mean that the OWNER or Engineer-in- Charge feels or considers that the particular thing is necessary, acceptable, desirable, or satisfactory, as the case may be.

2.0.4.0 Language: All documents pertaining to the contract, including drawings, manuals and any other writings shall be in the English Language. The translations, if any, in Hindi or any other language, as may be furnished by the OWNER of any of the documents forming the contract, shall not anyway operate as the contract between the parties or regulate upon the terms and conditions of the Contract Documents with the intention that all rights and obligations of the parties in terms of Contract Documents and any reference to the Contract or Contract Documents or any of them shall be deemed the rights and obligations arising out of the Contract Documents as written in English and/or Contract or Contract Documents or any of them as written in English; and no claim, dispute, difference or other objection will lie or will be entertained by the OWNER on account of any difference in the import or interpretation between any provision in the Hindi or any other language translation of the Contract documents and the Contract Documents in English.

2.0.5.0 Measurement Units: The metric system of measurement units shall be used in the contract, unless otherwise expressly stipulated.

2.0.6.0 The several Contract Documents forming the contract are to be read together as a whole and are to be taken as mutually explanatory.

2.0.7.0 Should there be any doubt or ambiguity in the interpretation of the Contract Documents or error, omission or contradiction therein or in any of them, the CONTRACTOR shall, prior to commencing the relative work, apply in writing to the Engineer-in Charge for his decision in resolution of the doubt, ambiguity or

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contradiction or correction of the error or omission, as the case may be. Should the CONTRACTOR fail to apply to the Engineer-in-Charge for his decision, as aforesaid, prior to commencing the relative work, the CONTRACTOR shall perform the said work at his own risks, and the provisions of Clause 2.0.10.0 hereof shall apply to any such work performed by the CONTRACTOR.

- 2.0.8.0 Notwithstanding anything provided in Clause 2.0.7.0 hereof above, either the CONTRACTOR or the Site Engineer may at any time prior to, during or after the execution of the work or any part thereof (if the CONTRACTOR has failed to make an application as provided for in Clause 2.0.7.0 apply to the Engineer-in-Charge in writing for his decision in resolution of any doubt, ambiguity or contradiction, in the Contract Documents or any of them for the correction of any error or omission therein, as the case may be.
- 2.0.9.0 The decision of the Engineer-in-charge or any application under-Clause 2.0.7.0 or Clause 2.0.8.0, hereof shall be in writing and shall be final and binding upon the CONTRACTOR and shall form part of the Contract Documents, with the intent that the Contract Documents shall be read as though the said decision is and was at all times incorporated therein.
- 2.0.10.0 In the event of the CONTRACTOR having already performed or executed any work at variance with the decision of the Engineer-in-Charge as aforesaid, then, notwithstanding payment in respect of such work having been made to the CONTRACTOR, such work shall be deemed to be a defective work and the provisions of Clause 5.1.4.0 hereof and associated clause there under shall apply thereto.
- 2.0.11.0 Any work shown, indicated or included in the job Description, Plan(s), Drawing(s), Specifications and/or Schedule of Rates shall be deemed to form part of the work, notwithstanding failure to show, indicate or include such work in any other or others among the Documents aforesaid with the intent that the indication or inclusion of the work within any one of the said documents shall be deemed to be a sufficient indication or inclusion of the work within the work covered by the contract.
- 2.0.12.0 No verbal agreement, assurances, representations or understanding given by any employee or officer of the OWNER or so understood by the CONTRACTOR, whether given or understood before or after the execution of the contract, shall anyway bind the OWNER or alter the Contract Documents unless specifically given in writing and signed by a person specifically authorized by the OWNER and given as an Agreed Variation to the relative term(s) in the Contract Documents.
- 2.0.13.0 Clause headings given in this or any other Contract Document are intended only as, a general guide for convenience in reading and segregating the general subject of the various clauses, but do not form part of the Contract Documents, with the intent that the clause headings shall not govern the meaning or importation of the clauses there under appearing or confine or otherwise affect the interpretation thereof.
- 2.0.14.0 In case of irreconcilable conflict in non-technical matters between the provisions in the separate contract documents concerning or governing the same aspect precedence shall be given to the provisions contained in the documents mentioned below in the order in which they are set out below:



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1. Formal Contract
2. Acceptance of Tender
3. Price Schedule annexed to Letter of Acceptance.
4. Agreed Variations annexed to the Letter of Acceptance.
5. Addenda to the Tender documents.
6. Special Conditions of Contract
7. Special Instructions to Tenderers/ Bidders
8. General Conditions of Contract
9. Instructions to Tenderers

A variation or amendment issued after the execution of the formal contract shall take precedence over the formal contract and all other Contract Documents.

- 2.0.15.0 In case of irreconcilable conflict in technical matters between the provisions in two separate contract documents concerning or governing the same aspect, clauses 2.0.7.0 and 2.0.8.0 shall be applied.

**2.1.0.0 SECURITY DEPOSIT:**

- 2.1.1.0 The CONTRACTOR shall furnish Security Deposit in the amount equivalent to 3 % ( three percent) of the total contract value. Such Security Deposit is to be held by the OWNER as security for the due performance of the Contractor's obligations under the contract.

- 2.1.1.1 The CONTRACTOR shall, within 30 (thirty) days of the receipt of Acceptance of Tender issued by the OWNER, deposit Security Deposit in an amount equal to 3 % ( three percent) of the total contract value as aforesaid, in one or more of the following modes, subject to the stipulation(s) contained in the said Acceptance by the OWNER.

- a) By Demand draft/Pay Order drawn on a Banking Branch of a Nationalized/Scheduled Bank payable to the OWNER at the location where the Office of the OWNER is situated.(cheques shall not be accepted).
- b) If the Earnest Money Deposit has been made in cash or by Demand Draft, the CONTRACTOR may be permitted to adjust the same towards part of the Security Deposit and pay the balance in the manner stipulated at (a) above.
- c) By Bank Guarantee(s) in the prescribed form as included in the Tender Documents, from a Scheduled Bank in India acceptable to the OWNER, provided the amount covered by such Bank Guarantee is not less than Rs.1,00,000/- (Rupees One Lakh only). This Bank Guarantee shall be valid upto a period of 3 (three) months beyond the end of the Defect Liability period.

- 2.1.1.2 The Earnest Money deposited by the CONTRACTOR along with his Tender shall, unless it has been adjusted in accordance with clause 2.1.1.1(b) above, be

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refunded by the OWNER, after the Security Deposit, has been deposited by the CONTRACTOR.

- 2.1.1.3 If at any time during the course of the work, the gross value of the work, as reflected by the Running Bills submitted by the CONTRACTOR has in the opinion of the OWNER (which shall be final and binding on the CONTRACTOR), exceeded or is likely to exceed the Total Contract Value indicated in the acceptance of Tender, the CONTRACTOR shall be bound to pay further Security Deposit as will make up the total Security Deposit to 3 % ( three percent) of the then anticipated Contract Value, failing which the OWNER shall be at liberty to make such deductions towards Retention Money(ies) from the CONTRACTOR's Running Bills, and will, at all times, ensure that the Security Deposit does not fall below 3 % ( three percent) of the gross value of the work, as reflected by the gross payments made to the CONTRACTOR, without taking into account any deductions. If the shortfall in Security Deposit is discovered after completion of the work, the shortfall shall be made good by the CONTRACTOR on demand from the OWNER, failing which, it will be recovered from any money(ies) due to the CONTRACTOR from the OWNER under this contract and/or any other contract with the OWNER.
- 2.1.1.4 If after completion of the work, the Total Contract value falls below the Total Contract Value as indicated in the Acceptance of tender, such that the total Security Deposit (made up of Security Deposit and Retention Money(ies) or otherwise) in the hands of the OWNER is in excess of the Total Security Deposit calculated at 3 % ( three percent) of the reduced contract value, such excess amount, as is in the form of cash in the hands of the OWNER, shall be refunded to the CONTRACTOR along with the Final Bill. If the Security Deposit furnished by the CONTRACTOR to the OWNER in the form of Bank guarantees is in excess of the full Security Deposit calculated on the contract value, by over Rs. 1 lakh, the CONTRACTOR shall be permitted to replace the Bank Guarantee(s) already submitted, by Bank Guarantee(s) to cover the reduced value of Security Deposit.
- 2.1.1.5 The Security Deposit shall be held by the OWNER as security for the due performance of the CONTRACTOR's obligations under the Contract. PROVIDED that nothing herein stated shall make it incumbent upon the OWNER to utilize the Security Deposit in preference to any other remedy which the OWNER may have, nor shall be construed as confining the claims of the OWNER against the CONTRACTOR to the quantum of the Security Deposit.
- 2.1.1.6 The Security Deposit including the Earnest Money/Retention money(ies), and other withheld amounts from the Running Account Bill(s), if any, at any time remaining in the hands of the OWNER shall be free of any liability for payment of any interest to the CONTRACTOR.
- 2.1.1.7 Upon determination of the contract prior to completion of work(s) for any cause, the OWNER shall in so far as the Security Deposit constitutes cash, refund and in so far as the Security Deposit is in any other form, release/discharge/return, as the case may be, to CONTRACTOR the unutilized balance of the Security Deposits, if any, for the time being remaining in the hands of the OWNER after



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settlement of accounts and discharge of all amounts due from the CONTRACTOR to the OWNER and fulfillment of all obligations of the CONTRACTOR.

2.1.1.8 In case Mobilization Advance is paid to the CONTRACTOR under the provisions of Clause 6.4.5.0 hereof, it shall be permissible for the CONTRACTOR to furnish a Composite Bank Guarantee to cover both Mobilization Advance as well as Security Deposit, which shall be subject to the following conditions:

- a) The Composite Bank Guarantee will be for a value equivalent to the advance plus 3 % ( three percent) of the Total Contract Value and shall be kept valid unto 3 (three) months beyond the expiry of the Defect Liability Period;
- b) Recoveries will be effected from each Running Account Bill at the rate of 10% (ten percent) of the gross bill value, till the entire Mobilization Advance (together with interest accrued thereon) is fully recovered.
- c) All the other stipulations hereof in respect of Security Deposit shall apply.

2.1.1.9 The CONTRACTOR shall from time to time at the request of the OWNER suitably extend the validity of any Bank Guarantee (whether furnished by way of Security Deposit or Composite Bank Guarantee) or to secure any advance for such period(s) as may from time to time be required by the OWNER failing which, without prejudice to any other right or remedy available to the OWNER, the OWNER shall be entitled to encash the Bank Guarantee.

#### **2.2.0.0 PLANS, DRAWINGS, SPECIFICATIONS AND APPROVALS TO BE FURNISHED BY THE OWNER.**

2.2.1.0 Plan(s) and drawing(s) and other information forming part of the Tender Documents shall constitute only a general guidance to enable the CONTRACTOR to visualise the work, and/or supplies contemplated under the Contract. These have been prepared and released in good faith on the basis of information available to the OWNER. The OWNER assumes no responsibility as to the correctness thereof, and the CONTRACTOR is expected prior to tendering to have undertaken a complete and independent survey and to have made his own study of all factors relevant to the performance of the work or making the supplies.

2.2.2.0 Detailed working plan(s), drawing(s), any specification(s) and approval(s) required to be furnished by the OWNER for the actual execution of the work, shall be furnished from time to time as and when required during the execution of the work.

2.2.3.0 It shall be the exclusive responsibility of the CONTRACTOR to call upon the Engineer- in-charge (in respect of approvals to be furnished by the OWNER) for and to pursue and obtain from the Engineer-in-Charge any plan(s), drawing(s), specification(s) or approval(s) required to be furnished to the CONTRACTOR under the contract for the proper execution of the work or any particular item or job therein or the making of any supply, as the case may be, as and when required, sufficiently in advance of the stage of delivery of the materials or of the commencement or progress of the work for the performance or continuance of which the same shall be required. Any failure by the CONTRACTOR to do so shall be entirely at the risks and costs of the CONTRACTOR and shall not constitute a ground for the extension of time, unless the Engineer-in- Charge

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shall fail to provide the CONTRACTOR plan(s) drawing(s), specification(s) or approval(s) or approval(s) or disapproval(s) as the case may be within 15 (fifteen) days of notice by the CONTRACTOR to the Engineer-in-charge specifically stating the drawing(s) specification(s) or approval(s) which is/are pending and the period for which it/they are pending the reasons(s) for which they are pending and that the notice is being given pursuant to the provisions of this clause on the clear understanding that, if the plan(s), drawing(s), specification(s) or approval(s) or disapproval(s) is/are not granted within 15 (fifteen) days, the CONTRACTOR will be making claim for deemed approval pursuant hereto. If thereafter, said notice notwithstanding, the approval or disapproval, as the case may be, is not granted within 15 (fifteen days) the relative approval(s) in Code 2 shall be deemed to have been granted and the relative approval shall at the request of the CONTRACTOR be certified thereon by the General Manager and the CONTRACTOR shall proceed with the work accordingly, without entitlement to any extension of time on this account.

- 2.2.4.0 The CONTRACTOR shall carefully study the plans/drawings furnished to him, in conjunction with all other connected plans/drawings and other Contract documents and shall bring to the notice of the Engineer-in-Charge for clarification/correction any ambiguity, error, discrepancy, contradiction or omission therein prior to the execution of the related work(s) or undertaking the related supply(ies) as the case may be, and the provisions of Clause 2.0.9.0 hereof shall mutatis mutandis apply to such clarification or correction.
- 2.2.4.1 Any work performed by the CONTRACTOR in absence of or contrary to such clarification/ correction, shall be at the CONTRACTOR's risks and responsibilities and the provisions of Clauses 2.0.10.0 and 5.1.4.0 hereof and associated clauses there under with respect to defective works shall apply thereto.
- 2.2.5.0 Notwithstanding anything to the contrary in the Contract Documents expressed or implied, and notwithstanding the absence of any ambiguity, error, discrepancy, contradiction or omission in the plans/drawings as aforesaid, the OWNER shall be entitled at any time before or during execution of the related work(s) to amend/modify or alter any plan(s), drawing(s) or specifications furnished to the CONTRACTOR by the OWNER and the CONTRACTOR shall thereafter perform and/or continue to perform the related work(s) according to the amended/modified/alterd plans/drawings/specifications without entitlement to any extra remuneration and should the CONTRACTOR execute any relative work(s) at variance therewith (notwithstanding that the CONTRACTOR shall have already been made any payment in respect thereof), the provisions of Clause 5.1.4.0 hereof and associated clauses there under relating to defective works shall apply thereto, provided that :
- (i) If any such amendment/modification/alteration shall in the opinion of the CONTRACTOR, necessitate an extension of time for completion, the provisions of Clause 4.3.5.0 hereof and clauses, related thereto shall apply.
  - (ii) If such amendment or modification shall in the opinion of the Engineer-in-

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Charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR) necessitate the performance of any work not covered by the Schedule of Rates or the lump sum price, as the case may be, the remuneration for such work or portion or item thereof, as the case may be, not covered by the Schedule of Rates or lump sum price, as the case may be, shall be determined in accordance with the provisions of Clause 2.4.1.2 hereof.

- 2.2.6.0 Copies of all plans and drawings relating to work(s) shall be kept and maintained at the CONTRACTOR's office at the site and shall be made available to the Engineer-in- Charge and Site Engineer for inspection and reference at any time during the execution of work.
- 2.2.7.0 All plans and drawings furnished by the OWNER to the CONTRACTOR shall be and remains the property of the OWNER and shall be returned by the CONTRACTOR to the OWNER on completion of the works or prior determination of the contract.
- 2.3.0.0 PLANS, DESIGN, DRAWINGS & SPECIFICATIONS TO BE FURNISHED BY THE CONTRACTOR**
- 2.3.1.0 Where the CONTRACTOR, shall within the scope of work, be required to prepare or furnish any plan(s), drawing(s), design(s) or specifications in respect of the work or any particular work, the CONTRACTOR shall within 15 (fifteen) days (or such other period as the OWNER may prescribe in this behalf) of receipt of notification of Acceptance of Tender or within 15 (fifteen) days before the proposed date of commencement of the relative work, whichever shall be earlier, submit to the OWNER for approval the relative plan(s), drawing(s), design(s) or specification(s). The OWNER shall be entitled at any time to suggest any amendment(s)/modification(s) in the plans, designs, drawings or specifications and the CONTRACTOR shall thereupon either convince the OWNER of the un-necessity in whole or portion of such amendment/modification or shall implement the same and shall cause the plans, drawings, designs or specifications to be accordingly amended, provided that no such approval of or amendments or modifications in the plans, drawings, designs or specifications by or suggested by the OWNER shall anyway absolve the CONTRACTOR of any of his obligations, responsibilities or liabilities under the Contract inclusive of and relative to the utility and suitability of the CONTRACTOR's plans, drawings, designs or specifications for the relative work(s) and the fulfillment of all specifications and performance guarantees of the consequent works, any such approval is intended only to satisfy the OWNER of the prima facie suitability of plan, drawing, design or specification and any such suggestion by the OWNER as aforesaid or otherwise is intended only by way of suggestion to the CONTRACTOR to meet the contractual requirements, without any attendant liability upon the OWNER.
- 2.3.2.0 The CONTRACTOR shall not permit any work to be done or any installation, material or equipment to be supplied or fabricated or erected at variance with plans, drawings, designs or specifications approved by the OWNER and/or amended or modified as aforesaid.
- 2.3.3.0 Unless otherwise required, at least 3 (three) sets of all approved plans, drawings,

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designs and specifications prepared by the CONTRACTOR, together with similar set of all revisions, amendments, and modifications therein shall be lodged with the OWNER for the record of the OWNER. Such sets of plans, drawings, designs and specifications shall be signed by the CONTRACTOR and shall indicate thereon the number and date of each revision, amendment and/or modification of communication by the OWNER or any consultant appointed by the OWNER for or relative to the approval thereof.

#### **2.4.0.0 ALTERATIONS IN DESIGNS, PLANS, DRAWINGS, SPECIFICATIONS, ORDERS AND INSTRUCTIONS**

2.4.1.0 In addition to the provisions of Clause 2.2.0.0 and associated clauses there under, the Engineer-in-Charge and/or Site Engineer shall have the power, by written notice to the CONTRACTOR at any time prior to or in the course of the execution of works or any part thereof, to alter or amend the specifications, orders and/or instructions or any of them by addition, omission, substitution or otherwise howsoever with or without altering or amending the plans, drawings and/or design and the CONTRACTOR shall carry out the related work in accordance with such altered specifications, orders, instructions, plans, drawings and/or designs as the case may be, on the same terms and conditions in all respects, subject to the provisions of Clause 2.4.1.2 hereof.

2.4.1.1 If such alteration or amendment shall, in the opinion of the CONTRACTOR, necessitate an extension in the time for completion, the provision of Clause 4.3.5.0 hereof and related clauses with regard to the extension of time, shall apply.

2.4.1.2 (a) If such alteration or amendment shall, in the opinion of the Engineer-in-Charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR), necessitate the performance of any work not covered by the schedule of Rates, the remuneration for such work or portion or item thereof not covered by the Schedule of Rates shall be determined in the following manner:

(i) If it is possible to derive the rate(s) for such work or items of work from any of the items of material and/or work covered in the Schedule of Rate(s), the rate(s) for the relative works/items shall be the rate(s) arrived at on the basis of such derivation. The opinion of the Engineer-in-Charge as to whether or not the relative rates can be derived from the rates for the items of material and/or work included in the Schedule or Rates and the consequent derivation of rate(s) on basis thereof shall be final and binding upon the CONTRACTOR.

(ii) If, in the opinion of the Engineer-in-Charge, the relative rate(s) shall not be derivable within the provisions of paragraph (i) hereof above, the relative rate(s) shall be the rate(s) for the work or items of work settled as follows:

An analysis of the rate for the completed work or items shall be prepared by taking (if and so far as applicable):


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- A) Issue rate(s) for materials supplied by the OWNER, if applicable;  
 B) Materials supplied by the CONTRACTOR and incorporated in the permanent works at the rate(s) (if any) for material specified in the relevant Schedule forming part of the Contract; and  
 C) Labour cost at rate(s) for labour, if any, specified in the relevant Schedule forming part of the Contract.

- (iii) The opinion of the Engineer-in-Charge as to the quantity of material and/or labour involved shall be final and binding on the CONTRACTOR.
- (iv) In the event of any item of material or labour involved not being covered by the relevant schedule forming part of the Contract for the purpose of determining the rates in terms of items (B) and/or (C) of paragraph (ii) above, market rates shall be taken into account for such items of materials and labour as are not covered by the relevant schedules forming part of the contract and there shall be added thereto 15% (fifteen percent) to cover CONTRACTOR's supervision, overheads and profits. For the purpose of clarification, it is stated that 15% (fifteen percent) addition shall apply only for any item not covered by the relevant schedule of the Contract.
- (v) The opinion of the Engineer-in-Charge as to whether or not any particular item(s) of material(s) or labour involved is covered by the relevant Schedule(s) and if not as to the market rate(s) thereof shall be final and binding upon the CONTRACTOR.
- (b) If any alteration, amendment or modification shall, in the opinion of the Engineer- in-charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR) result in a reduction or increase or change in the work or supply covered by the lumpsum Price so as to render unreasonable the lump sum Price, the OWNER and the CONTRACTOR shall negotiate a suitable increase or reduction, as the case may be, in the lump sum Price, and failing agreement on a negotiated rate for the item by appropriate reduction/increase, as the case may be, the Engineer-in-Charge shall fix the reduction or increase as he considers reasonable in the circumstances to the lump sum Price, and the lump sum Price shall be deemed to be accordingly amended to the extent applicable to the work covered by the alteration or amendment.

2.4.1.3 Pending finalization in respect of the revised rate of any item in the Price Schedule or increase/reduction in the lump sum Price pursuant to the provisions of clause 2.4.1.2 hereof, the CONTRACTOR shall continue and be bound to continue and perform the works and/or make the supply to completion in all respects according to the contract (unless the contract or works be determined by the OWNER) and the CONTRACTOR shall be liable and bound in all respects under the contract.

2.4.2.0 The rate(s) for any work determined in accordance with the provisions of Clause 2.4.1.2 above shall for the purpose of the Contract with respect to the work or



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item of work or supply affected by such amendment, alteration or modification be deemed to be rate(s) for such work or item(s) of work within the Schedule of Rates, or the lump sum Price, as the case may be.

- 2.4.3.0 The CONTRACTOR shall not be entitled to any compensation in addition to the payment for the work actually performed by the CONTRACTOR calculated on the basis of the Schedule of Rate(s) or lump sum Price or as provided for in Clause 2.4.1.2 hereof, as the case may be, as a result of any amendment or variation in the specification, orders, instructions, plans, designs or drawings notwithstanding that such alteration(s)/ variation(s) may have resulted in a reduction of the total quantum or value

of the work involved under the Contract, except as provided for in clause 2.6.2.0 hereunder.

#### 2.5.0.0 ALTERATION IN THE SCOPE OF WORK

- 2.5.1.0 The OWNER may, at any time(s) before or after the commencement of the work, by notice in writing issued to the CONTRACTOR, alter the scope of work by increasing or reducing the works or the jobs required to be done by the CONTRACTOR or by adding thereto or omitting there from any specific works or jobs or operations or by substituting any existing works or jobs or operations with other works or jobs and/or operations or by requiring the CONTRACTOR to perform any additional works in or about the job site, and upon receipt of such notice the CONTRACTOR shall execute the job(s) as required within the altered scope of work.

- 2.5.2.0 If any alteration in the scope of work shall, in the opinion of the CONTRACTOR, necessitate any extension in the time for completion, the provisions of Clause 4.3.5.0 hereof and associated clauses with regard to the extension of time shall apply.

- 2.5.3.0 (a) If such alteration shall, in the opinion of the Engineer-in-Charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR), necessitate the performance of any work not covered by the Schedule of Rates, the remuneration for such work or portion or item thereof not covered by Schedule of Rates shall be determined in accordance with the provisions of Clause 2.4.1.2 hereof.

(b) If in the opinion of the Engineer-in-Charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR) any alteration in the scope of the work shall result in any reduction or increase or change in the work or supply covered by the lump sum price so as to render unreasonable the lump price, the lump sum Price shall be increased or reduced, as the case may be, in accordance with Clause 2.4.1.2 hereof.

- 2.5.3.1 Providing determination of the rates aforesaid, the provisions of clause 2.4.2.0 shall mutatis mutandis apply.

- 2.5.4.0 The CONTRACTOR shall not be entitled to any compensation in addition to the payment for the work actually performed by the CONTRACTOR calculated on

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the basis of the Schedule of Rates or lumpsum Price or as provided in Clause 2.4.1.2 hereof, as the case may be, as a result of any alteration in the scope of work notwithstanding that such alteration may have resulted in a reduction in the total quantities or value of work- involved, except as provided for in clause 2.6.2.0 hereunder.

## 2.6.0.0 QUANTITIES OF WORK

2.6.1.0 Subject to the provisions of Clause 2.6.2.0 hereof, the quantities of work stated in the Form of Schedule of Rates do not form part of the Contract and the OWNER shall not be liable for any increase or decrease in the actual quantities of work performed (notwithstanding the percentage of such increase or decrease), nor shall such increase or decrease in the actual quantities form the basis of any alteration of rates quoted and accepted or in the lump sum price or for any claim for additional compensation, damages or loss or profits or otherwise, with the intent that the CONTRACTOR shall notwithstanding the quantities mentioned in the Form of Schedule of Rates only be entitled to payment in respect of actual quantities of work performed in terms of the contract and measured in the Final Measurements, notwithstanding the percentage of

increase or shortfall in such quantities and notwithstanding that the total contract value for the completed works on finalization of all dues to the CONTRACTOR under the contract shall be less than the total contract value as specified for the purpose of Security Deposit in the Acceptance of Tender.

2.6.2.0 DELETED

## 2.7.0.0 CANCELLATION OF CONTRACT

2.7.1.0 The OWNER shall be entitled at any time at his discretion to cancel the contract. If, in the opinion of the OWNER, the cessation of the work becomes necessary owing to any cause whatsoever, and a notice in writing from the OWNER to the CONTRACTOR of such cancellation and the reason(s) therefore shall be conclusive proof of such cancellation and the reasons therefore.

2.7.2.0 Upon cancellation of the Contract, the Engineer-in-Charge may require the CONTRACTOR:

- i) To perform to completion or to any other Intermediary stage of completion to the satisfaction of the Engineer-in-Charge any work(s) already commenced by the CONTRACTOR; and
- ii) To take such steps as are considered necessary by the Engineer-in-Charge for properly protecting and securing the works performed by the CONTRACTOR, to the satisfaction of the Engineer-in-Charge..

And the CONTRACTOR shall act accordingly and the same shall be deemed to be included within the CONTRACTOR's scope of work.

2.7.3.0 Upon receipt of a notice as specified in Clause 2.7.1.0 hereof the CONTRACTOR



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shall, unless the notice otherwise requires:

- (i) Immediately discontinue work and/or supply from the date and to the extent specified in the notice;

Not place any further orders or sub-Contracts for materials, services or facilities other than as may be necessary or required for completing or performing such portion of the work(s) or supplies which the CONTRACTOR is required to complete or perform;

- (iii) Promptly make every reasonable effort to obtain cancellation or fulfilment, as the case may be, at the option of the Engineer-in-Charge/OWNER of all orders and

SUB-CONTRACTS to the extent they relate to the performance of the work(s) or supplies cancelled.

- (iv) Assist the Engineer-in-Charge/OWNER as specifically requested in writing by the Engineer-in-Charge/OWNER in the maintenance, protection and disposition of property/works acquired by the OWNER pursuant to the Contract.

2.7.4.0 Upon cancellation of the Contract, the OWNER shall take over from the CONTRACTOR the approved surplus materials supplied by the CONTRACTOR for permanent incorporation in the work and lying at the job site on the date of receipt of notice of cancellation by the CONTRACTOR and the decision of the Site Engineer as to the approved materials lying at site on the date of cancellation and the quantities thereof, shall be final and binding upon the CONTRACTOR.

2.7.5.0 Upon cancellation of the Contract, the CONTRACTOR agrees to waive any claim for damages including loss of anticipated profits on account thereof, and as the sole right and remedy of the CONTRACTOR against the OWNER resultant upon such cancellation the CONTRACTOR agrees to accept from the OWNER the following namely:

- (i) The cost of settling and paying claims for cancellation or completion of pending orders and/or sub contracts as provided for in sub-clause (iii) of clause 2.7.3.0 hereof;
- (ii) The cost of protecting, securing and/or maintaining the works pursuant to the provisions of sub-clause (ii) of Clause 2.7.2.0 hereof and/or sub-clause (iv) of Clause 2.7.3.0 hereof;
- (iii) Payment for the supplies actually made determined in accordance with the provision of Clause 2.4.1.2 hereof.
- (iv) Payment for the work actually performed by the CONTRACTOR calculated on the basis of Unit Rates or lump sum rates wherever applicable. Where Unit Rates or lump sum rates are not applicable and/or the relative works are incomplete, the provisions of Clause 2.4.1.2 shall apply for calculating remuneration.
- (v) The cost of materials taken over by the OWNER pursuant to the provisions of clause 2.7.4.0 hereof.

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(vi) An allowance, if any due, as determined by the Engineer-in-Charge (whose decision shall be final) to cover the cost of CONTRACTOR's actual mobilization and demobilization at job site for the work to the extent uncovered by payments under items (i) to (iv) above.

And the CONTRACTOR shall not be entitled to any compensation in addition to the payments specifically provided for above and the CONTRACTOR hereby specifically waives any and all contrary rights and claims whatsoever.

## 2.8.0.0 SUSPENSION OF WORK

2.8.1.0 The Engineer-in-Charge may at any time(s) at his discretion, should he consider that the circumstances so warrant (the decision of the Engineer-in-Charge as to existence of circumstances warranting such suspension shall be final and binding upon the CONTRACTOR), by notice in writing to the CONTRACTOR temporarily suspend the work or supply or any part thereof for such period(s) as Engineer-in-Chief shall deem necessary and the CONTRACTOR shall upon receipt of the order of suspension forthwith suspend the work(s) or supply(ies) or such part thereof as shall have been suspended until he has received a written order from the Engineer-in-Charge to proceed with the work suspended or any part thereof.

2.8.1.1 During the period of any suspension under Clause 2.8.1.0 the CONTRACTOR shall at his own cost within the scope of the relative work properly protect and secure the work and materials so far as is necessary in the opinion of the Engineer-in-Charge.

2.8.2.0 If the suspension under Clause 2.8.1.0 is for reasons of force majeure as defined in Clause 4.3.8.0 or by reason(s) of default or failure on the part of the CONTRACTOR or is for the purpose of ensuring safety of the work(s) or any part thereof or is necessary for the proper execution of the work(s) or is for reason(s) of weather affecting the safety or quality of the work(s) or materials (the reasons for the suspension stated by the Engineer-in-Charge in any notice of Suspension as aforesaid, inclusive as to existence of default or failure on the part of the CONTRACTOR, if so stated in the notice, shall be final and binding upon the CONTRACTOR), the CONTRACTOR shall not be entitled to claim compensation for any loss or damage sustained by the contractor by virtue of any suspension as aforesaid notwithstanding that consequent upon such suspension the machinery, equipment and/or labour of the CONTRACTOR or any part thereof shall be or become or be rendered idle and notwithstanding that the CONTRACTOR shall be liable to pay salary, wages or hire charges or bear other charges and expenses thereof.

2.8.2.1 Unless the suspension is by reason of default or failure on the part of the CONTRACTOR (and the reasons for the suspension stated by the Engineer-in-Charge in any notice of suspension as aforesaid inclusive as to the existence of default or failure on the part of the CONTRACTOR if so stated in the notice, shall be final and binding upon the CONTRACTOR), if in the opinion of the CONTRACTOR such suspension shall necessitate any extension in the time of completion, the provisions of Clause 4.3.5.0 hereof and related clauses in respect of extension of time shall apply.

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- 2.8.2.2 In the event of a suspension affecting the entire works remaining in operation in respect of the entire works for a period in excess of 4 (four) months from the date of commencement of the suspension, the CONTRACTOR shall have the option at any time before the issue of an order by the OWNER or the Engineer-in-Charge removing the suspension, to terminate the Contract by giving written notice thereof to the OWNER. Unless the suspension be by reason of default or failure on the part of the CONTRACTOR, as specified in Clause 2.8.2.0 hereof, such termination shall be deemed to operate as a cancellation of Contract within the provisions of Clause 2.7.1.0 hereof and the provisions of Clause 2.7.2.0 to 2.7.5.0 hereof shall mutatis mutandis apply thereto.
- 2.8.2.3 In the event of such termination being upon a suspension consequent to a default or failure by the CONTRACTOR, the CONTRACTOR shall not be entitled to any damage, compensation, loss of profit or other compensation whatsoever in addition to payment for the completed supplies made and completed works, done in terms of the Contract in accordance with the provisions of sub-clauses (iii), (iv) & (v) of clause 2.7.5.0 hereof.
- 2.8.2.4 Notwithstanding anything provided in Clause 2.7.0.0 and/or Clause 2.8.0.0 and related Clauses thereunder, upon a cancellation of the contract under the provision of Clause 2.7.1.0 hereof or termination of the contract under provisions of Clause 2.8.2.2 hereof, the provisions of Clauses 7.0.3.0 to 7.0.7.0 hereof consequent upon termination of Contract, shall apply. Should the termination be one to which the provisions of Clause 2.8.2.3. hereof apply, then the provision of Clause 7.0.2.0., 7.0.8.0, 7.0.9.0, 7.1.0.0 and 7.2.0.0 consequent upon termination of Contract shall also mutatis mutandis apply.
- 2.8.2.5 Except for a suspension by a written order of the Engineer-in-Charge under clause 2.8.1.0 hereof, the CONTRACTOR shall not suspend the work for any cause and any such suspension if it occurs, shall be likely to be attended by consequences under clause 7.0.1.0 (i) (g) hereof.

### SECTION - 3

#### MATERIALS, LABOUR AND EQUIPMENT

##### 3.0.1.0 CONTRACTOR'S RESPONSIBILITY

- 3.0.1.0 Notwithstanding anything to the contrary in the Contract Documents express or implied, the CONTRACTOR shall be and remain at all times exclusively responsible to provide all material, labour, equipment, machinery, facilities, utilities and consumables and temporary works and other items and things whatsoever required for or in connection with the work, including, but not limited to those indicated by expression or implication in the job Description, Schedule of Rates, the Specification, Plans, Drawings, and/or other Contract Documents or however otherwise as shall or any from time to time and at any time be necessary for or in connection with the work, either for incorporation in or within the permanent works or in or relation to the execution and

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performance of the work.

### **3.1.0.0 MATERIALS SUPPLIED BY THE CONTRACTOR**



3.1.1.0 Materials supplied by the CONTRACTOR shall conform to the specifications and shall be suitable for the purpose for which they are required.

3.1.2.0 Unless otherwise specified by the OWNER, all materials supplied by the Contractor shall bear the ISI stamp and shall be supplied by reputed manufacturers or suppliers approved by the OWNER or listed for the relative materials with the DGS&D and/or borne on the approved list of suppliers maintained for relative items by such organizations as are approved by the Engineer-in-Charge. If in respect of any materials, including but not limited to sand, stone, aggregate, bricks, earth, lime, steel and cement neither ISI marking/approval nor any approved list of suppliers is available, such materials shall be obtained from sources/suppliers/manufacturers approved by the Engineer-in-Charge provided that no approval by the Engineer-in-Charge or any other representative of the OWNER for the supply of ISI stamped materials or of materials supplied by DGS&D listed suppliers or other approved suppliers shall relieve the CONTRACTOR of his full responsibility in respect of the suitability and quality of the material or any defects therein or in any works or construction in or relative to which the same has been utilized.

3.1.3.0 Notwithstanding that any area(s) or source(s) has/have been allotted or suggested by the OWNER to the CONTRACTOR from which any materials for incorporation in the works can be obtained, the CONTRACTOR shall independently satisfy himself of the suitability, accessibility and sufficiency of the source(s) of supply suggested or allocated by the OWNER and suitability of materials available from such source(s), with the intent that any allotment or suggestion as aforesaid shall not anyway relieve the CONTRACTOR of his full liability in respect of the suitability and quality of material(s) there from and incorporate the same within the permanent works entirely at his own risks and costs in all respects, with the intent that any such allocation or suggestion by the OWNER shall only be by way of assistance to the CONTRACTOR and shall not entail any legal or financial responsibility or liability upon the OWNER.

3.1.4.0 Notwithstanding any other provisions in the Contract Documents for analysis or tests of materials and in addition thereto, the CONTRACTOR, shall if so required for reasonable cause by the Engineer-in-Charge or Site Engineer in writing at his own risks and costs, analyze, test, prove and weigh all materials (including materials incorporated in the work(s)) required to be analyzed, tested, proved and/or weighed by the Engineer-in-Charge or Site Engineer and shall have such analysis test conducted by the agency(ies), if any, specified by the Engineer-in-Charge or Site Engineer. The CONTRACTOR shall provide all equipment, labour, materials and other things whatsoever required for testing, preparation of the samples, measurement of work and/or proof or weighment of the materials as directed by the Engineer-in-Charge or Site Engineer.

3.1.5.0 The OWNER does not warrant or undertake the provision of any material(s) and

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the CONTRACTOR shall not imply by conduct, expression or assurance or by any other means any promise or obligation on the part of the OWNER in this respect understood by the CONTRACTOR, unless made by specific written instrument forming part of the CONTRACT or appropriately entitled as an amendment to the Contract.

### 3.2.0.0 MATERIAL AND EQUIPMENT SUPPLIED BY THE OWNER:

#### 3.2.1.0

In the case of contracts (including for equipment erection and/or piping), for which the OWNER undertakes the procurement and supply of equipment and materials, the supply of equipment and materials to the CONTRACTOR shall be on the following terms and conditions:

- (a) Deliveries shall be either from the storage of the OWNER or from the factory/storage of supplier or from nearest suitable railhead or other point(s) of collection as may be determined by the OWNER taking into account the source(s) of supply of the material.
- (b) It shall be the responsibility of the CONTRACTOR at his own risks and costs to take delivery of the materials from the stores, factory, railhead or other collection point, as the case may be, and to arrange for its loading, transportation to job site and unloading at the job site or other place of storage. The CONTRACTOR shall in taking delivery ensure compliance of any conditions for delivery applicable to deliveries from OWNER's or supplier's factory/stores or railways or other transporters concerned, and shall be exclusively responsible to pay and bear any demurrage or penalty or other charges payable by virtue of any failure or delay by the CONTRACTOR in lifting the supplies and/or any failure by the CONTRACTOR to observe the conditions of supply as aforesaid, and shall keep the OWNER indemnified from and against all consequences thereof.
- (c) The CONTRACTOR shall inspect the equipment and materials supplied to him at the time of taking delivery thereof and satisfy himself of the quality, quantity and condition thereof prior to taking delivery and the OWNER shall not be liable for any claims or complaints whatsoever in respect of quality, quantity or conditions of the equipment or materials once the CONTRACTOR has taken delivery thereof.
- (d) The CONTRACTOR shall on receiving and opening the packing cases or other packaging of equipment and material on behalf of the OWNER, verify and tally the actual contents with the packing list and bring any discrepancies to the notice of the Engineer-in-Charge and the Site Engineer. The CONTRACTOR shall also sort out and segregate and hand over to the OWNER's stores, the Instruction Manuals, Operation and Maintenance Manuals, Special Maintenance Tools, Erection Spares, Commissioning Spares, and Maintenance Spares and other extras, if received with the main equipment. The Erection Spares may be got issued from the OWNER's stores if required, after getting authorization from the Engineer-in-charge. The Commissioning Spares may be got issued from the OWNER's Stores, if commissioning is included in the CONTRACTOR's scope.
- (e) The equipment and/or material(s) supplied or procured by the OWNER shall be utilized by the CONTRACTOR only for incorporation in the permanent



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works and even so shall not (unless specifically authorized by the OWNER in this behalf) be utilized for manufacturing any item(s) which can be obtained in finished form from standard manufactures.

- (f) The CONTRACTOR shall furnish to the Engineer-in-Charge sufficiently in advance a detailed statement showing his requirement of the types and quantities of equipment and materials agreed to be supplied by the OWNER, indication of the time when relative types and quantities thereof shall be required by him for the works so as to enable the OWNER to verify the quantities of materials specified by the CONTRACTOR and to enable the OWNER to make arrangements for the supply thereof.
- (g) The OWNER shall not be responsible for any delay in the supply of any equipment and/or materials supplied or procured or agreed to be supplied or procured by the OWNER, and no such delay or failure shall anyway render the OWNER liable for any claim for damages or compensation by the CONTRACTOR notwithstanding that an increase in the time of performance of the contract be involved by virtue of such delay and notwithstanding any labour, machinery or equipment brought upon the job site by the CONTRACTOR for the performance of the work being rendered idle by such delay or failure, PROVIDED that if such delay shall in the opinion of the CONTRACTOR, necessitate an extension of time for completion, the provisions of clause 4.3.5.0 hereof relating to extension of time and associated provisions thereof shall apply.
- (h) The CONTRACTOR shall maintain a day to day account of all equipment and materials supplied to him by the OWNER indicating the daily receipt(s), consumption and balance(s) in hand of each material and category thereof. Such account shall be maintained in such form (if any) as shall be prescribed by the Engineer-in-Charge and shall be supported by all documents necessary to verify the correctness of the entries in the account. Such account shall be maintained at the CONTRACTOR's office at the site, and shall be open for inspection and verification (by verification of documents in support of the entry as also by physical verification of the stocks) at all times by the Engineer-in-Charge and Site Engineer without notice and for the purpose the Engineer-in-Charge and Site Engineer shall be permitted and enabled without obstruction to enter into any godown or other place or premises where the equipment or materials or any part thereof shall be stored and to inspect the same and to take by himself and/or through his representative(s) an inventory thereof.
- (i) All equipment and materials supplied by the OWNER shall be taken delivery of, held, stored and utilised by the CONTRACTOR as trustee of the OWNER, and delivery of material to the CONTRACTOR shall constitute an entrustment thereof by the OWNER to the CONTRACTOR, with the intent that any utilization, application or disposal thereof by the CONTRACTOR otherwise than for permanent incorporation in contractual works in terms hereof shall constitute a breach of trust by the CONTRACTOR.
- (j) The CONTRACTOR shall hold and store any equipment or material(s) supplied by the OWNER only at such place and/or premises as may be approved by the Engineer-in-Charge, provided that no such approval shall

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absolve the CONTRACTOR in whole or part of his full liabilities in respect of such material, and the CONTRACTOR shall be and remain responsible at all times at his own risk and cost to ensure that the material(s) supplied by the OWNER is/are retained at all times in premises that are air and water tight and otherwise suitable for the storage of the concerned equipment or materials so as to prevent damage or deterioration for any cause whatsoever or theft or other loss, and shall arrange such watch and ward therefore as shall be necessary to ensure the safety thereof.

- (k) The Engineer-in-Charge may at his discretion require that all premises in which any equipment or materials supplied by the OWNER are stored, shall be double- locked with the keys to one lock retained by the Site Engineer or his representative and the other with the CONTRACTOR with the intent that all issues of OWNER supplied equipment and materials shall be with concurrence of the Site Engineer or his representative, as the case may be, provided that any such double-locking and/or concurrence as aforesaid shall be an additional precaution and shall not anywise absolve the CONTRACTOR of his full liabilities or responsibilities in respect of such equipment or materials.
- (l) The equipment supplied by the OWNER shall be insured by the OWNER against normal risks during transit, storage and erection. The CONTRACTOR shall, however, be responsible forthwith to make and pursue on behalf of the OWNER any and all claims under the policy(ies) and to fulfill all formalities required to obtain payment thereunder and/or to assist the OWNER in making or pursuing any such claim(s) and/or in obtaining payment thereunder.
- (m) The CONTRACTOR shall be required to take out at his own cost and initiative and keep in force at all times during the pendency of the contractual work, policy(ies) of insurance against the risks of fire, lightning and theft and against any other damage or loss, for the full value of the OWNER supplied materials lying in the CONTRACTOR's custody and/or storage pending utilization/ incorporation in the work and during incorporation in the work. The insurance shall be kept valid till the completion of the work and till the materials are duly accounted for to the satisfaction of the OWNER.
- (n) Such insurance policy(ies) shall be in the joint names of OWNER and the CONTRACTOR with exclusive right in the OWNER to receive all money(ies) due in respect of such policy(ies), and with right in the OWNER (but without obligation to do so) to take out and/or pay the premia for any such policy(ies) and deduct the premia and any other costs and expenses in this behalf from the money(ies) for the time being due to the CONTRACTOR.
- (o) Notwithstanding anything stated above, it shall be the responsibility of the CONTRACTOR to lodge with insurers and follow up claim(s), if any, under any policy(ies) of insurance aforesaid, and nothing herein provided shall absolve the CONTRACTOR from his full liabilities under the provisions of this clause and associated provisions hereof.
- (p) Where the OWNER issued materials are being stored within the battery area under the security and gate-pass control of the OWNER and are covered by





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the Overall Storage-cum-insurance Policy taken by the OWNER for the works, the OWNER may, at his sole discretion, permit the CONTRACTOR to furnish an Indemnity Bond in the proforma prescribed by the OWNER, for the entire value of

the OWNER supplied materials and for the entire duration during which the materials shall be lying in the storage and custody of the CONTRACTOR.

- (q) No such Insurance(s), as aforesaid, shall anyway absolve the CONTRACTOR from his full liabilities hereunder, with the intent that the same shall be held merely by way of additional security and not by way of substitution of liability. The CONTRACTOR shall at all times be exclusively responsible for any and all loss(es), damage(s), deterioration, misuse, theft or other application or disposal of the equipment or material(s), supplied by the OWNER or any of them contrary to the provisions hereof and shall keep the OWNER indemnified from and against the same and shall forthwith at his own cost and expense replace any such equipment and material(s) lost, damaged, deteriorated, misused, stolen, applied and/or disposed as aforesaid, with other equipment or material of equivalent quality and quantity to the extent that the same is not covered by any insurance as above, and if covered, payment under the relative policy(ies) is for any reason not available to the OWNER.
- (r) The CONTRACTOR shall use the equipment and materials supplied by the OWNER for incorporation in the Permanent works, carefully and judiciously with no wastage or the minimum possible wastage, wherever some wastage is inevitable or unavoidable, in any case within the wastage limit, if any, specified by the OWNER in respect of any such materials. For any excess wastage or scrap, due to misuse or injudicious, careless or wrong use of OWNER supplied materials, or in case of loss, damage or deterioration of the materials during storage with the CONTRACTOR, as to all of which the decision of the Engineer-in-charge shall be final and binding on the CONTRACTOR, the CONTRACTOR shall be bound to replace the material of equivalent quantity and grade, acceptable to the OWNER within the time limit specified by the OWNER, and where this is not possible, practicable or advisable, in the opinion of the OWNER, which shall be final and binding on the CONTRACTOR, the OWNER shall be compensated by the CONTRACTOR for the loss caused, for the replacement costs, which shall be worked out by the OWNER based on the assessed landed cost plus the costs of procurement at 15% (fifteen percent) of the assessed landed costs for the OWNER. This amount shall forthwith be remitted by the CONTRACTOR within a week of demand made by the OWNER, failing which the OWNER shall be entitled to recover/adjust the amount demanded from any money(ies) due from the OWNER to the CONTRACTOR and / or from any Security or any other deposits of the CONTRACTOR lying with the OWNER, under this and/or any other contract, without any further notice to the CONTRACTOR. The decisions of the OWNER in respect of the actions contemplated in this clause shall be final and binding on the CONTRACTOR.
- (s) Notwithstanding anything herein provided and notwithstanding the transfer of all risks in respect of such equipment and materials to the CONTRACTOR, the Ownership in respect of all OWNER supplied equipment and materials

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shall at all times be and remain in the OWNER.

- (t) The excess equipment and material and the scrap material generated from the work, in so far as the OWNER supplied materials are concerned, shall be returned to the OWNER's Stores. On completion of the work, the CONTRACTOR shall duly render accounts for the materials and equipment issued by the OWNER, to the satisfaction of the OWNER. Any shortages, losses and/or damages shall be to the CONTRACTOR's account and all the conditions stipulated under sub-clause(r) above shall apply in this case also.

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### 3.3.0.0 POWER, WATER & OTHER FACILITIES

3.3.1.0 The CONTRACTOR shall be responsible to provide within the scope of work all facilities, consumables and utilities necessary for performance of the work including (but not limited to) water, power, transportation, labour, tools, construction and testing equipment, machinery and land at or about the job site(s) for the CONTRACTOR's field offices, godowns, workshop, residential accommodation for CONTRACTOR's staff; quarry rights and borrow areas, access roads and right(s) of way to or about the job site(s) and CONTRACTOR's offices, godowns, workshop accommodation, quarries and/or borrow areas.

3.3.2.0 The OWNER does not warranty or undertake the provision of any facility, consumable or utility whatsoever to the CONTRACTOR, or assistance in obtaining/procuring the same or other assistance whatever for or in the performance or testing of the work and the CONTRACTOR shall not imply by conduct, expression or assurance or by any other means, any promise or obligation on the part of OWNER contrary to the provisions hereof and any such promise or obligation understood by the CONTRACTOR shall not be binding upon the OWNER.



3.3.3.0 Any assistance which the OWNER renders to the CONTRACTOR in terms hereof or otherwise relative to the work by provision of any facility, utility, consumables, water, power, transportation, labour, tools, construction and/or testing equipment and machinery, provision of land for quarries or borrow areas or for Contractor's office, godowns, workshops or accommodations or provisions of right of way, access road(s) and/or railway siding facilities, or other facility, utility, or consumables for or in the performance of the work shall not for any cause afford a basis or defence to the CONTRACTOR for the performance of any of his obligations under the Contract, nor a ground for extension of time for completion or other claim whatsoever.

### 3.3.4.0 POWER SUPPLY:

3.3.4.1 Without prejudice to the provisions of Clause 3.3.0.0 hereof and following clauses thereunder, as and when adequate power supply becomes available for the site, the OWNER may at its discretion provide supply of power to the CONTRACTOR for the work from the nearest sub-station, from which source the CONTRACTOR shall at his own cost and initiative make arrangement for temporary distribution of power to CONTRACTOR's work(s) at the sit

3.3.4.2 All arrangements for the distribution of power from sources aforesaid and the work relative thereto shall be made/performed/installed in conformity with Indian Electricity Regulations, and shall be subject to prior approval of the Site Engineer.

3.3.4.3 The CONTRACTOR shall, at his own costs and initiative on completion or prior determination of the work or otherwise during execution of the work, if required by the Site Engineer because of hindrance caused thereby or for any other cause, forthwith remove or re-route the distribution lines/installations or other work(s) in respect thereof as the case may be, required to be removed/re-



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routed.

- 3.3.4.4 The OWNER shall recover from the CONTRACTOR for power consumed by the CONTRACTOR from OWNER's source(s) of supply at the rate prescribed by the OWNER in this behalf from time to time. The amount due to the OWNER in respect of such power supplied shall without prejudice to any other mode of recovery to the OWNER, be deductible from the Running Account/Final Bill(s) of the CONTRACTOR and/or any monies due to the CONTRACTOR under this or any other Contract from time to time.
- 3.3.4.5 The CONTRACTOR shall provide at his own cost suitable electric meters approved by the Site Engineer for measurement of Power units consumed by the CONTRACTOR for determination of the payment due thereon to the OWNER. Such meters shall be under the control and custody of the OWNER.
- 3.3.4.6 In the event of failure or defect of meter(s), power charges shall be calculated on the consumption determined by the Engineer-in-Charge (whose decision shall be final both as regards the existence of a defect or failure, and as regard the power consumed).
- 3.3.4.7 The OWNER may at any time without notice or specifying any cause suspend or discontinue power supply to the CONTRACTOR, and such suspension or discontinuance shall not entitle the CONTRACTOR to any compensation or damages nor shall constitute a basis for extension of time for completion.
- 3.3.4.8 Power supplied by the OWNER to the CONTRACTOR shall be entirely at the risk of CONTRACTOR as to the continuity and regularity of supply, maintenance of voltage and adequacy of load without any warranty by or liability to the OWNER in respect thereof and without entitlement of the CONTRACTOR on grounds of discontinuance, fluctuation of voltage or inadequacy of load or any other cause whatsoever to claim from OWNER in respect thereof or consequences thereof.

### 3.3.5.0 WATER SUPPLY

- 3.3.5.1 Without prejudice to the provisions of Clause 3.3.0.0 hereof and the following clauses thereunder, in the event of the OWNER having adequate source of water supply at the site available for distribution, the OWNER may at its discretion provide water to the CONTRACTOR for the work from the OWNER's source of supply upon the CONTRACTOR at his own cost and initiative providing suitable pumping installations and pipe network for the conduct of water to and distribution to the CONTRACTOR's place of work.
- 3.3.5.2 Such installation, pipes and other equipment shall be laid out/installed by the CONTRACTOR only with the prior approval of the Site Engineer so as not to interfere with the layout and progress of the other construction work at the site and access to or about the job site.
- 3.3.5.3 The CONTRACTOR shall forthwith on completion of the work or earlier determination of the contract or during the execution of the work(s), if so required by the Site Engineer, on ground of hindrance or obstruction caused thereby or other causes whatsoever at his own cost and initiative remove or re-route, as the case may be, any installations, pipes and/or other equipment or any part or portion thereof installed or erected by the CONTRACTOR for the

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conduction and/or distribution of water, and fill any trenches, ditches or other excavations made by the CONTRACTOR for the purpose thereof and restore the site to the same condition in which it was prior to the installation.

- 3.3.5.4 The OWNER shall recover from the CONTRACTOR for water consumed by the CONTRACTOR from OWNER's source of supply at the rate prescribed by the OWNER in this behalf from time to time. The amount due to the OWNER in respect thereof shall (without prejudice to any other mode of recovery available to other OWNER) be deductible from the Running Account/Final Bill of the CONTRACTOR and/or payments due to the CONTRACTOR from time to time under this or any other contract.
- 3.3.5.5 The CONTRACTOR shall provide at his own cost and initiative suitable water meters approved by the Site Engineer for measurement of water units consumed by the CONTRACTOR for determination of the payment due in this behalf to the OWNER. Such meters shall be under the custody and control of the OWNER.
- 3.3.5.6 In the event of failure or defect of meters, water charges shall be calculated on the consumption determined by the Engineer-in-Charge (whose decision shall be final both as regards the existence of a defect or failure and as regards the water consumed).
- 3.3.5.7 The OWNER may without notice or specifying any cause suspend or discontinue water supply to the CONTRACTOR and such suspension or discontinuation shall not entitle the CONTRACTOR any compensation or damages or constitute a basis for extension of time for completion or other claim whatsoever.
- 3.3.5.8 Water supplied by the OWNER to the CONTRACTOR shall be entirely at the risk of the CONTRACTOR as to the continuity and regularity of supply and maintenance and adequacy of pressure without any warrant by or liability to the OWNER in respect thereof and without entitlement to the CONTRACTOR on grounds of discontinuance, irregularity, drop or rise in pressure or other cause whatsoever to claim from OWNER in respect thereof or the consequences thereof.
- 3.6.0.0 LAND**
- 3.6.1.0 Without prejudice to the provision of Clause 3.3.0.0 hereof and following clauses thereunder, the OWNER may at his discretion and convenience, if it has sufficient available land at its disposal, provide land to the CONTRACTOR near or about the job site, for the construction of the CONTRACTOR's field office(s), godowns, workshops, assembly yard and residential accommodation required for or in connection with the execution of the work(s), free of charge. Such land shall be utilised by the CONTRACTOR only for the purpose of the contract and for the duration of the contract.
- 3.6.2.0 The CONTRACTOR shall at his own cost and initiative construct temporary buildings or other accommodation necessary for the purpose and make suitable arrangements for water and power supply thereto and for provision of sanitary, drainage and dewatering arrangements thereof in accordance with plans/designs/layouts previously approved by the Site Engineer in this behalf.
- 3.6.3.0 Any land provided by the OWNER to the CONTRACTOR within the provisions hereof shall be strictly on a licence basis, and shall not create any right, title



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or interest whatsoever in the CONTRACTOR herein or in respect thereof.

- 3.6.4.0 Notwithstanding anything herein provided, the OWNER reserves the right at any time during the pendency of the work to ask the CONTRACTOR to vacate the land or any part thereof on giving 7 (seven) days written notice to the CONTRACTOR in this behalf.
- 3.6.5.0 Forthwith on or before the expiry of such notice or within two weeks of the completion of the works or the earlier determination of the Contract, the CONTRACTOR shall remove all constructions, works, piping and other installations, whatsoever, not forming part of the contractual works put up or erected by the CONTRACTOR upon the land, and shall have the land cleared, leveled and dressed to the satisfaction of the Engineer-in-Charge.
- 3.6.5.1 The CONTRACTOR shall not be entitled upon any vacation or notice within the provisions of clause 3.6.5.0 hereof to claim any resultant compensation or damage from the owner, nor shall such notice or vacation constitute a ground or basis for any extension of time for completion.
- 3.6.5.2 Likewise, the OWNER may at its discretion and convenience upon such terms and conditions as the OWNER may prescribe in this behalf, arrange or allocate or provide to the CONTRACTOR, borrow area(s) or quarry or mining rights and/or any right(s) of way or other access to or about the job site and unless specifically excluded, the provisions of Clause 3.1.3.0 hereof above, shall apply in respect of any borrow area quarry, mining right and/or right of way or other access allocated, arranged, provided or permitted by the OWNER to the CONTRACTOR.
- 3.6.6.1 The OWNER shall be entitled, at any time without notice to the CONTRACTOR, to suspend or withdraw use by the CONTRACTOR of any such area, right or access as aforesaid and no suspension or withdrawal of such facility, or disruption or inadequacy thereof by virtue of flood, disrepair or other cause whatsoever, shall form the basis of any claim by the CONTRACTOR, for compensation or damages or ground for extension of time for completion. Upon such notice or within two weeks of the completion of the works or the earlier determination of the Contract the provisions of Clause 3.6.5.1 hereof shall mutatis mutandis apply.
- 3.7.0.0 Notwithstanding anything herein provided, the provisions of Clause 7.0.5.0 to 7.0.7.0 hereof and related clauses applicable consequent upon termination of contract shall apply to any breach by the CONTRACTOR of his obligations within the provision of Clause 3.4.1.2, 3.5.1.2, 3.6.5.1 and 3.6.6.1 hereof as to a breach of Clause 7.0.5.0 hereof.
- 3.8.0.0 ACCESS TO SITE:**
- 3.8.1.0 The CONTRACTOR shall construct, if necessary, at his own cost and Initiative, temporary access road to the site from the main public feeder road(s) and from borrow areas and mines and quarries, and shall so align such roads or ways so as not to interfere with the construction of the site or hamper construction of pavement roads by or on behalf of the OWNER or other CONTRACTORS operating at or about the job site.
- 3.8.2.0 The CONTRACTOR shall, if so required or relative to the performance of any

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other work at the site or construction of permanent roads, suspend, discontinue use of and/or re-route any access road constructed by him. No suspension, discontinuance or re-routing as aforesaid shall form the basis of any claims by the CONTRACTOR against the OWNER for compensation of damages or ground for extension of time for completion or other claim whatsoever.

### **3.9.0.0 LABOUR, MACHINERY & EQUIPMENT**

#### **3.9.1.0**

If, during the execution of the works, the OWNER shall for any cause find it necessary to do so, the OWNER may, at its discretion and convenience provide labour, machinery and/or equipment to the contractor for the performance of the work and/or testing of the works. The terms and conditions for provisions and/or hiring of such labour, equipment, machinery shall, in addition to any other condition relative thereto as may be specified by the OWNER, unless expressly excluded, be deemed to include the following:

- (i) **Charges:** The labour, equipment and/or machinery shall be supplied at the rate(s) in this behalf prescribed by the OWNER from time to time.
- (ii) **Recoveries:** The amount(s) recoverable by the OWNER from the CONTRACTOR in respect of labour, equipment and/or machinery procured or supplied by the OWNER shall (without prejudice to any other mode or recovery) be debited to the CONTRACTOR's account and deducted from the Running Account / Final Bill(s) of the CONTRACTOR and/or any monies from time to time becoming due to the CONTRACTOR.
- (iii) Any Labour, equipment and/or machinery supplied or procured by the OWNER shall be utilized by the CONTRACTOR only for use in the contractual work.
- (iv) The CONTRACTOR shall be responsible to ensure utilization of the equipment and/or machinery only within the capacity of such equipment and/or machinery, to ensure the proper utilization thereof in all respects without any manner of abuse or excess, and shall follow and obey all instructions or directions as shall or may be given by the Site Engineer in respect thereof, and if so required by the Site Engineer, shall provide at cost (to be determined by the Engineer-in-Charge in the event of dispute) labour for the operation, maintenance and repair of the equipment/machinery and/or shall operate, maintain and/or repair the same at his own costs and expenses, and provide all the inputs necessary for the operation, repair and maintenance thereof, including spare parts, fuel and lubricants. The CONTRACTOR shall keep the OWNER indemnified from and against all losses, damages and/or costs, charges and expenses resultant from any breach or failure to observe the provisions hereof.
- (v) The CONTRACTOR shall ensure the safe-keeping and custody of the equipment and machinery at the site and shall be exclusively responsible and accountable for any loss, damage, theft or misuse thereof (and shall make proper arrangement for the storage and watch and ward thereof) and shall keep the OWNER indemnified from and against the same.
- (vi) The CONTRACTOR shall ensure return of the equipment/machinery to the OWNER upon the Completion of the works or earlier determination of the



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Contract or as and when called upon by the OWNER to return the same during the execution of the work in the same condition in which the equipment /machinery was at the time of bringing the same to job site or delivery to the CONTRACTOR, as the case may be.

(vii) The provisions of Clause 3.2.1.0 hereof shall mutatis mutandis apply to equipment and machinery supplied by the OWNER to the CONTRACTOR.

### **3.10.0.0 GOVERNMENT CONTROLLED MATERIALS**

3.10.1.0 In respect of all Government controlled or other scarce/imported materials in respect of which licenses, release orders, permits or authorisations have been granted in the name of the OWNER, the CONTRACTOR shall be deemed to be acting on behalf of the OWNER and as agent of OWNER in respect of deliveries taken by the CONTRACTOR against any licences, release orders, permits, or authorisations issued in the name of OWNER for Government controlled materials. The ownership in such materials shall (without prejudice to the responsibility/liability of the CONTRACTOR in respect thereof as set out in the various conditions hereof) vest in the OWNER from the point of time when it would have ordinarily vested in the OWNER on a direct delivery to the OWNER.

### **3.11.0.0 VERIFICATION OF CHARACTER AND ANTECEDENTS OF CONTRACTUAL MANPOWER**

3.11.1.0 In all contracts involving deployment of contractor's manpower within MRPL premises like Plants and Offices etc. the contractor shall submit the following documents to MRPL prior to start of work:

- i. Undertaking from the contractor that they have scrutinised the previous work history of the person(s) proposed to be deployed by them and character and antecedents of person(s) proposed to be deployed by them is / are impeccable.
- ii. Along with the above mentioned undertakings, the contractor will provide certified photocopies of police verification certificate for inspection by the authorised representatives of MRPL. The contractor has to obtain Police Verification Report from the area where the person(s) to be deployed has / have been residing since the last five years. In case the person concerned has not resided at a place for five years at a stretch, Police verification reports should be obtained from that area where the person(s) has / have stayed earlier.
- iii. The contractor shall ensure at the time of submitting their final bills to the EIC, that it is accompanied by a NOC from Security Dept., MRPL, for having surrendered all Photo passes and Bio-Metric cards issued by MRPL. If any Pass and Bio-Metric Cards are not surrendered even after the completion of job / contract, the contractors are liable to pay a fine of Rs.200/- for every un-surrendered pass and Rs. 100/- for every Bio-Metric card (These fine amounts are subject to revision by Security Dept., MRPL, from time to time."

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## SECTION -4

### PERFORMANCE OF WORK



#### 4.0.0.0 GENERAL

- 4.0.1.0 All works shall be performed and executed by the CONTRACTOR in strict conformity with the Job Description, Specifications, Plans, Drawings, Designs and other Contract Documents applicable to the specific work(s) and any relative orders or instructions as may be issued to the CONTRACTOR by the Engineer-in-Charge or Site Engineer from time to time.
- 4.0.2.0 The Engineer-in-Charge and Site Engineer shall be entitled from time to time or at any time at their discretion in order to procure the proper performance of the work and/or the proper compliance with the specifications or other contractual requirements to issue written orders or instructions to the CONTRACTOR relative to the performance and/or execution of the work(s) by the CONTRACTOR or otherwise relative to any matter touching or affecting the Contract or arising therefrom, and to revise or revoke any orders or instructions previously issued, and the CONTRACTOR shall, subject to provisions of the following clause, obey and/or abide thereby.
- 4.0.2.1 Without prejudice to the provisions of Clause 4.0.2.0 hereof and associated clauses thereto, should the CONTRACTOR require any clarification in respect of any orders or instructions issued by the Engineer-in-Charge or Site Engineer, or should there appear to the CONTRACTOR to be any contradiction between any orders or instructions issued by the Engineer-in-Charge or Site Engineer and/or between any order(s), instruction(s) and the Contract Document or any of them, the CONTRACTOR shall refer the matter immediately in writing to the Engineer-in-Charge for his decision before proceeding further with the work, and the decision of the Engineer-in-Charge on any such matter shall be final and binding upon the CONTRACTOR, who shall perform the work accordingly without entitlement to any claim against or compensation from the OWNER resultant upon such order, instruction or decision.
- 4.0.3.0 The CONTRACTOR shall, within 10 (ten) days of receipt of notification of Acceptance of Tender, name at each job site at which the CONTRACTOR shall be awarded any work under the Contract, an engineer responsible for the work at the job site on behalf of the CONTRACTOR. The said Engineer of CONTRACTOR shall be the representative of

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the CONTRACTOR at the job site for and relative to all actions and transactions and dealings on behalf of the CONTRACTOR and to whom labour, materials, equipment and/or machinery procured or supplied by the OWNER may be given and to whom all Plans, Designs, Drawings, Orders and Instructions or other documents or communications for or relative to the job site may be given, with the intent that all transactions and dealings had with the said Engineer shall be deemed to have been had with the CONTRACTOR, and any and all Plans, Drawings, Designs, Orders, Instructions, Documents or Communications and/or labour, material, equipment or machinery delivered to said Engineer shall be deemed to have been delivered to the CONTRACTOR.

- 4.0.3.1 The Engineer(s)/supervisors appointed by the CONTRACTOR or his Sub-Contractors/ other agencies, for the work shall be duly and adequately qualified with relevant experience to handle the work of the contract to the satisfaction of the Engineer-in-charge. For this purpose, the CONTRACTOR shall furnish the bio-data of the Engineer(s) /supervisors proposed to be appointed by him for the work to the Engineer-in-charge for his approval. The CONTRACTOR shall be bound to appoint only such technical personnel as are approved by the Engineer-in-Charge for handing the work from time to time.
- 4.0.4.0 The CONTRACTOR shall provide and maintain, at or about each job site, an office for the working accommodation of the Contractor's engineer(s) and staff. Such office shall remain open and attended at all hours during which work is being performed at the job site, for the receipt of orders, instructions, notices, and other communications.
- 4.0.5.0 The CONTRACTOR shall co-operate with and afford the OWNER/Engineer-in-Charge and other CONTRACTORS engaged at the site, access to the work and supply at cost determined by the Engineer-in-Charge (whose decision shall be final) of power and water for the performance of the work entrusted to them and/or for the carriage and storage of materials by them and whenever any work is contingent or dependent upon the performance of any work by the CONTRACTOR or is being done in association, collaboration or in proximity with any other CONTRACTORS, the CONTRACTOR shall co-operate with the OWNER or other CONTRACTOR(s)/agency(ies) involved in such work to ensure the harmonious working between the CONTRACTOR and the OWNER/ CONTRACTOR(s), agency(ies) involved, and shall comply with any instructions issued by the Engineer-in-Charge for the purpose.
- 4.0.6.0 The OWNER/Engineer-in-Charge shall be entitled at its/his discretion, to appoint one or more Site Engineers and/or other personnel at or about each job site on behalf of the OWNER to do such acts, deeds, matters and things as may be necessary to safeguard the OWNER's interest including (but not limited to, at the discretion of the OWNER), supervision and testing of the work(s) being conducted by the CONTRACTOR at the job site and rendering such assistance to the CONTRACTOR relative thereto as the OWNER or such engineer(s) or personnel shall or may deem fit, it being understood, however, that the presence of any engineer(s) or personnel of the OWNER at or about each job site or any supervision, inspection or test performed or conducted by any such engineer(s) and/or personnel of the OWNER in respect of any work(s)

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or any other assistance rendered by such engineer(s) and/or personnel to the CONTRACTOR relative thereto, shall be without any attendant obligation or liability of the OWNER vis-à-vis the CONTRACTOR, nor shall relieve the CONTRACTOR of his full responsibility in respect of the work(s) under the Contract or bind the OWNER or accept as satisfactory or complete and/or in accordance with the Contract any work(s) performed by the CONTRACTOR which has/have been supervised, inspected, tested or assisted by the said engineer(s) and/or personnel of OWNER.

4.0.7.0 If the Contractor's work or any part thereof shall be consequent or resultant upon any works performed by any other person or shall be in continuance thereof or otherwise based or founded thereon, the CONTRACTOR shall before commencing with its/his work, bring to the notice of the Engineer-in-charge and the Site Engineer, in writing, any defects existing in said prior works, failing which the CONTRACTOR shall be deemed to have accepted as complete and proper the said prior works and to have waived any and all rights to complaint of or in respect of any defect(s) as may exist therein.



#### 4.1.0.0 THE JOB SITE

4.1.1.0 The Engineer-in-Charge shall furnish the CONTRACTOR with only four corners of the job site and a level bench mark, and the CONTRACTOR shall at his own cost and initiative set out the work to the satisfaction of the Site Engineer, but shall be solely responsible for the accuracy of such setting up notwithstanding the satisfaction as aforesaid of the Site Engineer or any other assistance rendered by the Site Engineer for the purpose.

4.1.2.0 The CONTRACTOR shall provide, fix and be responsible for the maintenance of all stakes, templates, contour and level marks, profiles and the like and shall take all precautions necessary to prevent their removal or disturbance, and shall be responsible for the consequence of such removal or disturbance and for their efficient and timely reinstatement. The CONTRACTOR shall also be responsible for the maintenance of all survey marks, boundary marks, distance marks, and center line marks, whether existing or supplied/fixed by the CONTRACTOR.

4.1.3.0 Before commencing the work, the CONTRACTOR shall at his own cost and initiative, provide all necessary reference and level posts, pegs, bamboos, flags, ranging rods, strings and other materials for proper layout of the work in accordance with scheme for benchmarks acceptable to the Site Engineer. The center, longitudinal or face line and cross line shall be marked by means of small masonry pillars. Each pillar shall have a distinct mark at the centre to enable a theodolite to be set over it. No work shall be started until all these points are approved by the Site Engineer, but, such approval shall not relieve the CONTRACTOR of any of his responsibilities in respect of adequacy or accuracy thereof. The CONTRACTOR shall also provide all labour, material and other facilities necessary for the proper checking of layout and inspection of the points during construction.

4.1.4.0 Pillars bearing geodetic marks located at the sites of works under construction should be protected and fenced by the CONTRACTOR.

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4.1.4.1 On completion of works, the CONTRACTOR must submit the Engineer-in-Charge the geodetic documents according to which the work was carried out.

4.1.5.0 The CONTRACTOR shall be exclusively responsible for provision and maintenance of horizontal and vertical alignments and levels and for the correctness of every part of the work in accordance therewith and shall at his own cost rectify any errors or imperfectness therein.

#### 4.2.0.0 **CONDITIONS OF WORK**

4.2.1.0 Work shall be carried on for a minimum of 48 (forty-eight) hours a week and 8 (eight) hours on any working day. If necessary, the CONTRACTOR shall work overtime or in two or more shifts in a day Except as herein specifically provided to the contrary, the CONTRACTOR shall not be entitled to any extra compensation or remuneration for overtime or double or triple shift working, nor shall the OWNER anywise be responsible for any idle time payments to CONTRACTOR's staff or for labour, equipment or machinery, howsoever occasioned; and the CONTRACTOR waives any and all contrary rights and claims.

4.2.1.1 Should it be necessary to work on Sunday and/or holiday, the CONTRACTOR shall so work without extra compensation, after obtaining prior approval from the Site Engineer or the Engineer-in-charge.

4.2.2.0 The execution of the work(s) shall entail working in all seasons including the monsoons. In so far as necessary, the CONTRACTOR shall maintain at each job site at all times such material, labour, pumps, equipment and machinery as may be required for the performance of the work during the monsoon or other rains and shall plan well in advance for the collection of material and equipment and the erection of such tarpaulins, sheds, wind breakers and/or other protection as shall or may be necessary for the work during the monsoon or other rains so that the rains or monsoon shall not hamper working.

4.2.2.1 The CONTRACTOR shall also arrange and bring to each job site such special equipment and machinery as may be necessary to enable work during the monsoon, and shall, at his own cost and initiative, arrange at all times for dewatering the job sites so as to keep the construction site and areas to be worked upon, free of water.

4.2.2.2 The CONTRACTOR shall not be entitled to any extra compensation or remuneration for or relative to any work to be done in any season including during the monsoon, or for or relative to any special arrangements to be made and/or equipment or machinery to be brought to the job site(s) to enable such working.

#### 4.3.0.0 **TIME FOR COMPLETION**

4.3.1.0 The CONTRACTOR shall complete in all respects in accordance with the Contract, the entire work at each job site within the time specified in this behalf in the Time Schedule.

4.3.2.0 If the OWNER so requires, the Progress Schedule in the form of PERT chart, giving the latest dates of starting and the latest dates of finishing of various operations comprising the work as also the activities in the critical path and



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latest dates for achievement of specific milestones in respect of the work so as to complete in all respects the works (including testing and consequential operations) within the time provided in the Time Schedule. This Progress Schedule should also indicate the interlinking of the various activities and bring to light the specific/critical items on which the inputs from the OWNER/Engineer-in-Charge/Consultant or other agencies, if any, would be required, to ensure adherence to the schedule.

- 4.3.3.0 If the CONTRACTOR shall fail to submit to the OWNER/Engineer-in-Charge a Progress Schedule as envisaged above or if the OWNER/Engineer-in-Charge and CONTRACTOR fail to agree upon the Progress Schedule as envisaged above, then the Engineer-in-Charge shall prepare the Progress Schedule (the dates of progress as fixed by the Engineer-in-Charge being final and binding upon the CONTRACTOR except as herein otherwise expressly provided), and shall issue the Progress Schedule so prepared to the CONTRACTOR which shall then be the Approved Progress Schedule and all the provisions of Clause 4.3.2.0 shall apply relative thereto.
- 4.3.4.0 Any reference in the Contract Documents to the “Approved Progress Schedule” or to the “Progress Schedule” shall mean the “Approved Progress Schedule” specified in Clause 4.3.2.0 above or the “Progress Schedule” prepared and issued by the Engineer-in-Charge as specified in clause 4.3.3.0 above, whichever shall be in existence. In the absence of such approved Progress Schedule or such Progress Schedule prepared by the Engineer-in-Charge, the Progress Schedule first prepared by the CONTRACTOR (with the incorporation of the OWNER’s/ Engineer-in-charge’s comments thereon, if any), shall until such approved Progress Schedule or such Progress Schedule prepared by the Engineer-in-Charge comes into existence, be deemed to be the Progress Schedule for the purpose of the Contract.
- 4.3.5.0 Within 7 (seven) days of the occurrence of any act, event or omission which, in the opinion of the CONTRACTOR, is likely to lead to delay in the commencement or completion of any particular work(s) or operation(s) or the entire work at any job site(s) and is such as would entitle the CONTRACTOR to an extension of the time specified in this behalf in the Progress Schedule(s), the CONTRACTOR shall inform the Site Engineer and the Engineer-in-Charge in writing of the occurrence of the act, event or omission and the date of commencement of such occurrence. Thereafter, if even upon the cessation of such act or event or the fulfillment of the omission, the CONTRACTOR is of opinion that an extension of the time specified in the Progress Schedule relative to particular operation(s) or item(s) or work or the entire work at the job site(s) is necessary, the CONTRACTOR shall within 7 (seven) days after the cessation or fulfillment as aforesaid make a written request to the Engineer-in-Charge for extension of the relative time specified in the Progress Schedule and the Engineer-in-Charge may at any time prior to completion of the work extend the relative time of completion in the Progress Schedule for such period(s) as he considers necessary, if he is of opinion that such act, event or omission constitutes a ground for extension of time in terms of the Contract and that such act, event or omission has in fact resulted in insurmountable delay to the

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**CONTRACTOR.**

- 4.3.5.1 The application for extension of time made by the CONTRACTOR to the Engineer-in-Charge should contain full details of:-
- a) The notice under Clause 4.3.5.0 with a copy each of the notice sent to the Engineer-in-Charge and Site Engineer.
  - b) The activity for the Progress schedule affected.
  - c) The bottleneck(s) or obstruction(s) perceived/experienced, and the reason(s) therefor,
  - d) Extension required/ necessitated on account of (c) above.
  - e) Extension required/necessitated on account of reasons attributable to the OWNER,
  - f) Extension required/necessitated on account of force majeure reasons, and
  - g) The total extension of time (if any) required/necessitated for completion, taking the above into account and after eliminating all overlaps.
- 4.3.5.2 The opinion/decision of the Engineer-in-Charge in this behalf and as to the extension of time necessary shall, subject to the provisions of clause 4.3.6.0 hereof, be final and binding upon the CONTRACTOR.
- 4.3.6.0 Notwithstanding the provisions of clause 4.3.5.0 hereof, the OWNER may at any time at the request of the CONTRACTOR made by way of appeal either against the decision of the Engineer-in-Charge taken under clause 4.3.5.0 or against the Engineer-in-Charge's refusal to take a decision under the said clause, if satisfied of the work or any item or operation thereof for such period(s) as the OWNER may consider necessary, and the decision of the OWNER as to the existence or otherwise of any grounds justifying the extension and as to the period(s) of extension necessary shall be final and binding upon the CONTRACTOR.
- 4.3.7.0 Subject as elsewhere herein or in the contract documents expressly provided, only the existence of force majeure circumstances as defined in clause 4.3.8.0 hereof shall
- afford the CONTRACTOR's ground for extension of time for completion of the work or any part of the work or any operation(s) involved therein, and specifically without prejudice to the generality of the foregoing, inclement weather, strike, shutdown, third party breach, delay in supply of material(s) or commercial hardship shall not afford the CONTRACTOR a ground for extension of time or relieve the CONTRACTOR of his/its full obligations under the Contract, nor will any forced shutdown or idleness or other impediment in progress or completion of the work due to any reason whatsoever afford the CONTRACTOR a ground for extension of time or relieve the CONTRACTOR of his/its full obligations under the Contract except and to the extent otherwise elsewhere herein specifically provided, nor shall any shut down or idle time charges be payable by the OWNER to the CONTRACTOR for delay in the commencement, progress or completion of the work due to any reason whatsoever, including due to the existence of force majeure circumstances.
- 4.3.8.0 The term "FORCE MAJEURE" as employed in this contract shall mean wars (declared or undeclared) or revolutions, civil wars, tidal waves, fires, major floods, earthquakes, epidemics, quarantine restrictions and freight embargoes and



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transporters strikes affecting the country as a whole.

- 4.3.9.0 Upon an extension of the time for completion of the work or any part of the work or any operation(s) involved therein pursuant to Clause 4.3.5.0 or Clause 4.3.6.0 hereof, the extended date/time of completion shall be deemed to be the relative date of completion in the Progress Schedule, and such extension shall constitute, the sole remedy of the CONTRACTOR for and/or arising out of such delays, and the CONTRACTOR hereby waives any and all contrary rights.
- 4.3.10.0 The mere fact that the OWNER shall not have terminated the contract or that the OWNER or Engineer-in-Charge has permitted the CONTRACTOR, for the time being, to continue with the work for its completion shall not prejudice the full rights and remedies available to the OWNER under the contract arising out of the delayed completion, including the right of Price discount, damages and/or termination. Such permission(s) shall unless specifically stated to be an extension of time under clause 4.3.5.0 or Clause 4.3.6.0, as the case may be, not be construed as extension(s) of time under Clause 4.3.5.0 or 4.3.6.0 hereof, and shall merely constitute an indication or intimation, as the case may be, of the OWNER's willingness, for the time being, to accept the delayed completion, subject to its rights under the Contract.
- 4.3.11.0 No assurance, representation, promise or other statement by any personnel, engineer or representative of the OWNER in relation to extension of time for commencement or completion of any work(s) or operation thereof or of the entire works under the Contract shall be binding upon the OWNER or shall constitute an extension of time for commencement or completion of the entire work(s) or any part or operation thereof within the provisions of Clause 4.3.5.0 or Clause 4.3.6.0 hereof, unless the same has been communicated to the CONTRACTOR in writing by the Engineer-in-Charge under Clause 4.3.5.0 or by the General Manager under Clause 4.3.6.0 and the writing specifically states that it embodies an extension of time within the provisions of Clause 4.3.5.0 or Clause 4.3.6.0 as the case may be, and without prejudice to the foregoing, the mere agreement or prescription or signing of a Progress Schedule by the Site Engineer or any site representative of the OWNER at variance with the Progress Schedule, as the case may be, referred to in Clauses 4.3.2.0, 4.3.3.0 and/or 4.3.4.0 hereof or containing an extended time of commencement or completion in respect of the entire work(s) or any part or operation thereof shall not anyway constitute an extension of time in the terms of the Contract so as to bind the OWNER or relieve the CONTRACTOR of all or any of his liabilities under the Contract, nor shall constitute a promise on behalf of the OWNER or a waiver by the OWNER of any of its rights in terms of the Contract relative to the performance of the Contract within the time specified or otherwise, but shall be deemed only (at the most) as a guidance to the CONTRACTOR for better organizing his work on a recognition that the CONTRACTOR has failed to organize his work and/or perform the same within the time specified in the Progress Schedule established within the provisions of Clause 4.3.2.0 or Clause 4.3.3.0 or Clause 4.3.4.0 hereof, as the case may be.

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**4.4.0.0**
**PRICE ADJUSTMENT FOR DELAY IN COMPLETION**
**4.4.1.0**

The contractual price payable shall be subject to adjustment by way of discount as hereinafter specified, if the Unit(s) are mechanically completed or the contractual works are finally completed, subsequent to the date of Mechanical Completion/final completion specified in the Progress Schedule.

**4.4.2.0**



If Mechanical Completion of the Unit(s)/final completion of the works is not achieved by the last date of Mechanical Completion of the Unit(s)/final completion of the works specified in the Progress Schedule (hereinafter referred to as the “starting date for discount calculation”), the OWNER shall be entitled to adjustment by way of discount in the price of the works and services in a sum equivalent to the percent of the total contract value as specified below namely:

- (i) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 1 (one) week of the starting date for discount calculation - 1% of the total contract value.
- (ii) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 2 (Two) weeks of the starting date for discount calculation - 2% of the total contract value.
- (iii) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 3 (Three) weeks of the starting date for discount calculation -3% of the total contract value.
- (iv) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 4 (Four) weeks of the starting date for discount calculation -4% of the total contract value
- (v) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 5 (Five) weeks of the starting date for discount calculation -5% of the total contract value.
- (vi) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 6 (Six) weeks of the starting date for discount calculation -6% of the total contract value.
- (vii) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 7 (seven) weeks of the starting date for discount calculation -7% of the total contract value.
- (viii) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 8 (Eight) weeks of the starting date for discount calculation -8% of the total contract value.
- (ix) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 9 (Nine) weeks of the starting date for discount calculation -9% of the total contract value.
- (x) For Mechanical Completion of the Unit(s)/final completion of the works achieved within 10(ten) weeks of the starting date for discount calculation -10% of the total contract value.

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(xi) The reduction in the contract price hereunder by way of price discount shall in no event exceed 10% (ten percent) of the total contract value.

- 4.4.2.1 The starting date for discount calculation shall be subject to variation upon extension of the date for Mechanical Completion of the Unit(s)/final completion of the works with a view that upon any such extension there shall be an equivalent extension in the starting date for discount calculation under Clause 4.4.2.0 hereof.
- 4.4.2.2 It is specifically acknowledged that the provisions of Clause 4.4.2.0 constitute purely a provision for price adjustment and/or fixation and are not to be understood or construed as a provision for liquidated damages or penalty under Section 74 of the Indian Contract Act or otherwise.
- 4.4.3.0 Application of price adjustment under clause 4.4.2.0 above shall be without prejudice to any other right of the OWNER, including the right of termination under clause 7.0.1.0 and associated clauses thereunder.
- 4.4.4.0 Nothing in Clause 4.4.2.0 above shall prevent the OWNER from exercising its right of termination of Contract under Clause 7.0.1.0 hereof and associated clauses thereunder, and OWNER shall be entitled, in the event of exercising its said right of termination after the last date for Mechanical Completion of the Unit(s) and/or final completion of the works as stipulated in the relative Progress Schedule without prejudice to any other right or remedy available to the OWNER, to discount as aforesaid in the contractual price of services in addition to any amount as may be due consequent to a termination under Clause 7.0.1.0 hereof and associated clauses thereunder.
- 4.5.0.0 SCHEDULE OF ACTIVITIES**
- 4.5.1.0 The provisions of this Clause 4.5.0.0 and associated Clauses hereunder shall apply only to a contract in which the Schedule of Rates specifies a lumpsum price payable for the whole or any part of the work(s) or activities covered by the Contract. If only part(s) of the work(s) or activities under the Contract are the subject of a lump sum price then the provisions of this clause shall apply only to such part.
- 4.5.1.1 The CONTRACTOR shall within 30 (thirty) days from the date of issue of the Letter of Acceptance, furnish to the OWNER a detailed schedule of Activities specifying in detail the various activities which the CONTRACTOR would be required to perform and the milestones with respect to each which the CONTRACTOR would have to achieve in order to set up and establish the unit.
- 4.5.2.0 Each activity entered in the schedule of Activities and each milestone therein shall be priced so as to break-up so far as possible, the lumpsum price of services into various priced milestones of achievements and priced activities required to achieve those milestones. The Schedule of Activities and the said priced break-up of activities therein are intended only to provide a basis for the purpose of calculating on account payments for services and for the calculating payments due to the CONTRACTOR under Clause 2.7.5.0 hereof upon cancellation of Contract, and for no other purpose.
- 4.5.3.0 The OWNER shall review or cause to be reviewed the prima facie adequacy,

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sufficiency, validity and/or suitability of the activities listed in the Schedule of Activities for the works they are intended, and of the prices indicated in the Schedule of Activities in respect thereof. Such review shall be performed in conjunction with the design, engineering, specification and other technical reviews to be done by the OWNER and all provisions applicable thereto shall be applicable to the review of the Schedule of Activities.

- 4.5.4.0 No such review shall in any manner absolve the CONTRACTOR of his full responsibility under the contract to perform within the lump-sum price of services specified in the Price Schedule, all services and to perform and undertake the work(s) required to set up and establish the Unit in accordance with the Contract and the specifications, complete in all respects, whether or not any particular work or activity required is included within the schedule of activities and whether or not the price thereof is included in the price indicated in the Schedule of Activities and whether or not the price thereof is in conformity with the price thereof indicated in the Schedule of Activities. The review and approval of the Schedule of Activities and the prices therein are intended only for the satisfaction of the OWNER that the priced Schedule of Activities prima facie covers the activities required to be performed by the CONTRACTOR within the scope of services.
- 4.5.5.0 The Schedule of Activities shall be subject to amendment in both items and prices in so far as necessary consequent upon any amendment in any relevant related technical particulars, and upon any amendment the amended Schedule of Activities as approved by the OWNER shall thereafter constitute the Schedule of Activities as envisaged in the Contract Documents.
- 4.6.0.0 REPORTS AND RECORDS**
- 4.6.1.0 The CONTRACTOR shall, from time to time, maintain at each job site (in addition to any records or registers required to be maintained by the CONTRACTOR under any law, rule or regulations having the force of law) such records and registers as the Engineer-in-Charge or Site Engineer shall or may require the CONTRACTOR to keep and/or maintain from time to time.
- 4.6.2.0 In addition to any other records or registers required to be maintained by the CONTRACTOR from time to time and/or the reports required to be furnished by the CONTRACTOR, the CONTRACTOR shall daily or otherwise as may be prescribed by Engineer-in-Charge or Site Engineer, submit to the Site Engineer a Progress Report of all work done and/or progress achieved by the CONTRACTOR at each job site within the preceding day or the period of last report, as the case may be.
- 4.6.2.1 The receipt and/or acceptance of any such report by the Site Engineer shall be without prejudice to the full rights and remedies of OWNER and obligations/liabilities of the CONTRACTOR under the Contract, and shall not anyway operate as an estoppel against the OWNER by reason of the fact that no notice or objection was taken of or to any information contained in any such report; nor shall any statement in any such report be deemed to be correct merely by virtue of the existence of such statement, and its being uncontroverted by any officer of the OWNER.

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4.6.3.0 The CONTRACTOR shall also maintain at each job site a Site Order / Site Instructions Book, in which the day to day instructions of the Site Engineer / Engineer-in-charge / other Inspecting Officers of the Owner shall be recorded. Each such Order / Instruction shall be duly acknowledged and compliance with the same shall also be recorded in the appropriate columns of the Site Order / Site Instructions Book. This Book shall be kept available for inspection by the Officers of the OWNER. The Site Order / Site Instruction Book shall be lodged with the Engineer-in-charge on completion of the Work or sooner determination of the contract for any cause.

#### 4.7.0.0 EXECUTION OF THE WORK

4.7.1.0 The CONTRACTOR shall provide sufficient labour, staff (qualified and unqualified), machinery, tools and equipment, material, consumables, utilities and things

whatsoever necessary for the proper performance of the work and to ensure the rate of progress as envisaged in the Progress Schedule.

4.7.1.1 All the skilled persons employed by the CONTRACTOR (directly or through his sub- contractors and/or other agencies) on the work shall be duly and adequately skilled in their respective trades, to the satisfaction of the Engineer-in-charge. Any person employed on the work found to be inadequately skilled or otherwise incompetent, may be directed by the Engineer-in-charge to be removed from the site and replaced by adequately skilled and competent persons and the CONTRACTOR shall forthwith comply with such directions of the Engineer-in-charge.

4.7.2.0 If, in the opinion of the Engineer-in-Charge or Site Engineer (the opinion of either of whom in this behalf shall be final), the work(s), operation(s) at any job site as a whole is/are not meeting the progress necessary to achieve the relative date of commencement or completion in the Progress Schedule, the Engineer-in-charge or Site Engineer may instruct the CONTRACTOR to employ/provide additional labour, staff, machinery, tools, equipment or material or things necessary to achieve the required progress and CONTRACTOR shall forthwith comply with instruction(s).

4.7.3.0 Should the CONTRACTOR fail to comply with such instruction(s) or fail to comply therewith to the satisfaction of the Engineer-in-charge (whose opinion in this behalf shall be final and binding upon the CONTRACTOR) the Engineer-in-charge may, at his discretion, at the risk and cost of the CONTRACTOR, appoint, procure or provide the additional labour, staff, machinery, equipment, tools and materials as the Engineer-in-charge (whose decision in this behalf shall be final and binding upon the CONTRACTOR), considers necessary to achieve the necessary progress in relation to any particular work or operation or the work as a whole. In so doing, Engineer-in-charge/ Site Engineer shall be deemed to be acting for and on behalf of and as agent of the CONTRACTOR and all such appointments, procurement and/or provision shall be deemed to have been made by the CONTRACTOR, and paid for by the CONTRACTOR. In addition to the other amounts payable to OWNER in respect of any labour, staff, machinery, equipment and/or material, as aforesaid procured or provided by the OWNER, the OWNER shall be entitled in this event



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to recover from the CONTRACTOR 15% (fifteen percent) as supervision charges on the total expenditure incurred by the OWNER under this clause, on behalf of the CONTRACTOR.

- 4.7.4.0 Without prejudice to the OWNER's rights under Clause 4.7.3.0 and in addition or as an alternative thereto, should the Engineer-in-charge at any stage (notwithstanding that the time for completion of the relative work or item of work as specified in the Progress Schedule has not expired) be of opinion (the opinion of the Engineer-in-charge in this behalf being final) that the performance of any work or item or work by the CONTRACTOR is unsatisfactory (whether in the rate of progress, the manner, quality or workmanship of the performance, or in the adherence to specifications, or in the omission, neglect or failure to do, perform, complete or finish any work or item, or for any other cause whatsoever), the Engineer-in-charge shall be entitled (without prejudice to any other rights of the OWNER and/or obligations of the CONTRACTOR under the Contract) at his discretion and the risk and cost of the CONTRACTOR appoint one or more sub-contractors for the satisfactory performance thereof or any part thereof, or may undertake the performance thereof or any part thereof departmentally, and the provisions of Clause 4.7.3.0 hereof shall mutatis mutandis apply to any action taken by the Engineer-in-charge pursuant to this clause in the same manner as applicable to an action taken under the said clause.
- 4.7.5.0 If the amount incurred by the OWNER/Engineer-in-charge, on account of carrying out works under Clause 4.7.3.0 and 4.7.4.0 above, is in excess of the amount due to the CONTRACTOR the OWNER shall be entitled to recover the same, at the OWNER's discretion from any amount due to the CONTRACTOR from the OWNER under this or under any other contract, and any Security Deposit(s) or Bank Guarantee(s) of the CONTRACTOR.
- 4.7.6.0 Any action taken by the Engineer-in-Charge or Site Engineer under Clauses 4.7.3.0 and / or 4.7.4.0 shall be without prejudice to the full rights of the OWNER and full liability of the CONTRACTOR under the Contract, including but not limited to the OWNER's full rights under Clause 4.4.0.0 and associated clauses thereunder, and under Clauses 7.0.7.0 and 7.0.8.0 hereof
- 4.8.0.0 **SUB CONTRACTS**
- 4.8.1.0 The CONTRACTOR shall not assign, sub-contract or sublet the whole or any part of the work in any manner, provided the CONTRACTOR may with the prior written approval of the Engineer-in-Charge, sub-contract any particular work or part of the work to a Sub-Contractor approved by the Engineer-in-Charge.
- 4.8.2.0 Notwithstanding approval of the sub-contract as aforesaid and notwithstanding that the OWNER/Engineer-in-Charge shall have received a copy of the Contract between the CONTRACTOR and sub-Contractor, the CONTRACTOR shall be and shall remain exclusively responsible to the OWNER for the due and proper performance of the Contract, and the Sub-Contractor shall for all purposes vis-à-vis the OWNER be deemed to be the servant/agent of CONTRACTOR employed

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for the performance of the particular work with full responsibility on CONTRACTOR for all acts, omissions and defaults of the sub-contractor.

4.8.3.0 Subject as hereinabove in this behalf specifically permitted and provided, the CONTRACTOR shall not sub-contract any work under the Contract and any sub-contract in breach hereof shall be deemed to be an unauthorized sub-contracting of the Contract or part or portion thereof sub-contracted, as the case may be.

4.8.4.0 If any sub-contractor engaged upon the work at the site executes any work which in the opinion of the Engineer-in-Charge is not of the requisite standard (the opinion of the engineer-in-charge being final in this behalf), then without prejudice to any other right or remedy available to the OWNER, the Engineer-in-Charge may, by written notice to the contractor, require the contractor to terminate such sub-contract, and the CONTRACTOR shall upon receipt of such notice, forthwith terminate such sub- contract at the risk and cost of the CONTRACTOR, and shall keep the OWNER indemnified from and against the consequences.

4.8.5.0 Notwithstanding such sub-contract being approved by Engineer-in-Charge as herein envisaged, the CONTRACTOR shall at the commencement of every month furnish Engineer-in-Charge with a list of all sub-contractors engaged and working at the site during the previous month, with particulars of the general nature of the works performed by them.

#### 4.9.0.0 MISCONDUCT

4.9.1.0 If and whenever any of CONTRACTOR's or sub-contractor's agent(s)/sub-agent(s), consultant(s) or employee(s) shall in the opinion of the Engineer-in-Charge or Site Engineer (whose opinion in this behalf shall be final) be guilty of misconduct or be incompetent or insufficiently qualified or negligent in the performance of his/their duties, or if in the opinion of the Engineer-in-Charge (which shall be final) it is undesirable for any reason (which need not be disclosed to the CONTRACTOR) for such person(s) to be employed in the work, the CONTRACTOR, if so directed by the

Site Engineer, shall forthwith remove or cause to be removed such person(s) from employment thereon, and any person(s) so removed shall not be re-employed in the work except with the prior permission in writing of the Engineer-in-charge. Any person(s) so removed from the works shall be immediately replaced at the expense of the CONTRACTOR by a qualified and competent substitute.

4.9.2.0 If, at any time, in the course of execution of the contract, the OWNER/Engineer-in- charge finds that any person employed by the CONTRACTOR or his sub- contractor(s) or other agency(ies) employed by the CONTRACTOR is not observing and/or is willfully flouting the operating security and safety precautions of the area in which he is working and/or are found to be indulging in activities prejudicial to the interest of the OWNER, the CONTRACTOR shall forthwith, on being directed by the OWNER/Engineer-in-charge in this behalf remove or cause to be removed such person(s), as may be named by the OWNER/Engineer-in-charge in this behalf, from the site, within 24 hours of such intimation and such person(s) shall not be re- employed in this



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work or any other work under the OWNER, without the prior written permission of the OWNER. All repatriations of any person(s) removed from the site shall be done by the CONTRACTOR at his own cost and the vacancy(ies) so caused shall be filled by the CONTRACTOR at his own expenses by competent substitutes.

- 4.9.3.0 If any activities of any such person are considered by the OWNER or Engineer-in-Charge to be criminal in character and/or prejudicial to the public or national interest, the CONTRACTOR shall, in addition to removing, such person(s) as stipulated in 4.9.2.0 above, also co-operate with the OWNER/Engineer-in-charge in lodging such complaints with the police or other authorities as the OWNER or Engineer-in-Charge considers necessary, and shall co-operate with the OWNER, in handing over such person(s) to the concerned authorities as decided by the OWNER.
- 4.9.4.0 The CONTRACTOR shall keep the OWNER indemnified from and against all personnel and third party claims whatsoever (inclusive of all costs incurred between attorney and client) arising out of any act or omission or intermission on part of any sub-contractor or agent, sub-agent, consultant, or employee of the CONTRACTOR or any sub-contractor, whether committed, omitted or arising with or without the scope of the contract, sub-contract, agency or employment, or otherwise.
- 4.10.0.0 **CHANGE IN CONSTITUTION OF THE CONTRACTOR:**
- 4.10.1.0 The CONTRACTOR, whether an individual, Proprietary concern, Partnership firm, Private Limited Company or Public Limited Company, shall not make any change(s) in its constitution, by transfer of substantial shareholding or of management (in the case of a company) or by addition or deletion of Partners, change in the terms of Partnership, or make any other material change(s) without prior intimation to and approval of the OWNER. Any such unauthorized change shall attract the provisions of Clause 7.0.1.0 hereof.
- 4.11.0.0 **DEVIATIONS AND VARIATIONS IN SPECIFICATIONS**
- 4.11.1.0 The Engineer-in-Charge may at his discretion, and without prejudice to any other right or remedy available to the OWNER in this behalf permit a deviation or variation from the Specifications or accept any work or items of work performed by the CONTRACTOR at variance with the Specifications and any such permission, deviation or variation shall ipsofacto be subject to the condition that the monetary benefit of the deviation or variation, as determined by the Engineer-in-charge (whose decision shall be final and binding upon the CONTRACTOR) shall be passed on to the OWNER. In such event the CONTRACTOR shall be entitled only to such remuneration in respect of such works or item(s) of work as may be determined by the Engineer-in-charge after reduction of the monetary benefit arising from the deviation or variation as determined

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by the Engineer-in-charge after reduction of the monetary benefit arising from the deviation or variation as determined by the Engineer-in-charge which determination shall not be disputable by nor can otherwise from the subject matter of a notified claim by the CONTRACTOR.

Any permission or acceptance for any deviation or variation in specification as envisaged in Clause 4.11.1.0 hereof shall not be undertaken by the CONTRACTOR unless specifically given in writing by the Engineer-in-charge to the CONTRACTOR in the absence of which any deviation taken or variation done in any work performed by the CONTRACTOR at variance with contractual specifications, shall be deemed to be defective works attracting consequences elsewhere herein specified with respect to defective work(s).

## **SECTION - 5**

### **INSPECTION, TESTING AND QUALITY ASSURANCE**

#### **5.0.1.0 QUALITY ASSURANCE**

5.0.2.0 Within two weeks of the receipt of the Letter of Acceptance from the OWNER, the CONTRACTOR shall submit to the Engineer-in-charge, a detailed Quality Assurance Plan envisaged by him for ensuring due and proper adherence to Quality as required by the Specification for the work. This Quality Assurance Plan (QAP) shall give in detail the Organization and Methodology, Checks and Controls, as well as the Correction mechanisms built into the QAP system as envisaged by the CONTRACTOR at the Site and elsewhere, for ensuring quality inputs into the work and for ensuring quality output on the job.

5.0.3.0 The Engineer-in-charge shall be entitled, from time to time and any time to make or cause to be made such addition(s), modification(s) or alteration(s) in the QAP as he considers necessary to improve the QAP ( the decision of the Engineer-in-charge in this behalf shall be final and binding on the CONTRACTOR), and the CONTRACTOR shall thereafter follow the QAP as added, modified or altered by the Engineer-in- charge.

#### **5.1.0.0 INSPECTION AND TESTING OF MATERIALS**

5.1.1.0 The Engineer-in-Charge shall be entitled at all times, at the risk of the CONTRACTOR, to inspect and/or test by itself or through an independent person(s) or agency(ies) appointed by the OWNER or Engineer-in-Charge and/or to direct the CONTRACTOR to inspect and/or test or to get inspected and/or tested, all materials, items and components, whatsoever supplied or proposed for supply for incorporation in the works, inclusive during the course of manufacture or fabrication by the CONTRACTOR and/or at the CONTRACTOR's or his sub-vendors' works or otherwise, of such material, item or component. The inspection and/or tests shall be conducted at the expense of the CONTRACTOR and may be directed by the OWNER or Engineer-in- charge to be

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conducted by authorized representatives of the OWNER/Engineer-in-charge or third party inspection agency(ies) appointed by the OWNER. The OWNER may also require that all the inspections and tests conducted by the CONTRACTOR at his works or his sub-vendors' works be carried out in the presence of authorized representatives of the OWNER/Engineer-in-charge/ third party inspection agency(ies) appointed by the OWNER. The CONTRACTOR shall provide the OWNER/Engineer-

in-charge and/or their representatives/Agents every facility of assistance necessary for carrying out or witnessing, as the case may be the Test(s) / Inspection(s).

- 5.1.2.0 The CONTRACTOR shall also on receipt of intimation of any communication of any inspection or tests by the OWNER/Engineer-in-Charge or any of their representative(s)/ agency(ies) nominated by the OWNER or Engineer-in-Charge in this behalf, present himself or his authorized representative at the place of inspection and/or testing to receive any orders or instructions consequent thereto, as shall be necessary.
- 5.1.3.0 The CONTRACTOR shall furnish to the Site Engineer for approval when requested, or as required by the specifications or other contract documents, adequate samples of all materials and finishes intended for incorporation in the works, such samples are to be submitted before the work is commenced permitting sufficient time for test(s)/ examination(s) thereof of the OWNER. All materials furnished and finishes incorporated in the work shall conform to the approved sample(s) in all respects.
- 5.1.4.0 The Engineer-in-Charge and/or Site Engineer shall be entitled to reject at any time any defective material, item or component (including specially manufactured or fabricated items and components) supplied by the CONTRACTOR for incorporation in the works, notwithstanding previous inspection and/or testing thereof by or on behalf of the OWNER without rejection and notwithstanding previous approval thereto by or on behalf of the OWNER (the decision of the Engineer-in-Charge as to any defect as aforesaid being final and binding upon the CONTRACTOR); and upon such rejection, the CONTRACTOR shall either perform such work or improvement thereon or in respect thereof, as shall be necessary to bring the material item/component to the requisite standard, or shall, if so required by the Engineer-in-Charge (whose decision in this behalf shall be final), remove the rejected material/item/component from the job site within the time specified by the Engineer-in-Charge or the Site Engineer and replace it at his own cost and expense (without additional remuneration or compensation in respect thereof) with material(s)/ item(s)/ component(s) approved by the Site Engineer. The provisions of clause 5.2.7.0 hereof shall mutatis mutandis apply to any failure or default by the CONTRACTOR to do so.



## 5.2.0.0 INSPECTION AND TESTING OF WORKS

- 5.2.1.0 The CONTRACTOR shall at all times ensure the highest standards of workmanship relative to the work, to the satisfaction of the Site Engineer or

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any Inspector(s) or Inspecting Agency(ies) nominated by the OWNER/Engineer-in-Charge in this behalf. The Site Engineer/Inspector(s)/Inspecting Agency(ies) shall have the power to inspect the work in all respects, at any and all times up to completion of the work as also to test or instruct the CONTRACTOR to test the works or any structure, material or component thereof at the risk and cost of the CONTRACTOR, either by the CONTRACTOR or by any agency(ies) nominated by the OWNER/Engineer-in-Charge or Site Engineer in this behalf.

- 5.2.1.1 The CONTRACTOR shall provide all facilities, instruments, material, labour and accommodation required for inspecting and testing the works (including checking the setting out of the works) and shall afford the Site Engineer/Inspector(s)/Inspecting Agency(ies) all assistance necessary to conduct the tests.
- 5.2.1.2 The CONTRACTOR shall also provide and keep at all times during the progress of the work and maintenance period, proper means of access to the works and every part thereof by means of ladders, gangways, etc., and necessary attendance to move and set up the same as directed by the Site Engineer/Inspector(s)/Inspecting Agency(ies) for inspection or measurement of the works.
- 5.2.2.0 On no account shall the CONTRACTOR proceed with concreting or other work such as (but not limited to) foundations, superstructure or edge preparation of pipes for welding by covering up or otherwise placing beyond the reach of inspection or measurement any works before necessary inspection entries are filled in the Site Inspection Register by the Site Engineer or the Inspector(s) or Inspecting Agency(ies)
- 5.2.3.0 Should the CONTRACTOR fail to comply with any of the provisions foregoing relative to inspection and/or testing of the works, the Engineer-in-Charge or Site Engineer shall in his absolute discretion; be entitled to remove/dismantle and/or uncover, as the case may be, at the risk and cost of the CONTRACTOR, for test and examination any works, structure or component thereof installed, erected or put up by the CONTRACTOR and to conduct or have conducted the test(s) and/or examination at the risk and cost of the CONTRACTOR. In such event, the CONTRACTOR shall also bear the risk and costs of replacement, reinstallation or re-erection of the concerned works, structure, or component, as the case may be.
- 5.2.4.0 Notwithstanding anything provided in the foregoing clauses hereof, the CONTRACTOR shall be and remain liable at his own cost and initiative to conduct all tests at all relevant times during supply, erection and installation of any works, structure, material or component as shall be required in terms of the Contract Documents or by any codes or specifications referred to therein or approved by the OWNER or the Engineer-in-Charge. Where the Contract Documents or codes or specifications do not state or nominate the agency or laboratory where such test shall be conducted, the same shall be conducted at the cost of CONTRACTOR through an agency(ies) or laboratory(ies) nominated by the OWNER or the Engineer-in-Charge for the purpose.
- 5.2.5.0 Should the Engineer-in-Charge or Site Engineer on inspection or testing be not

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satisfied with the quality or workmanship of any works, structure, item or component (the decision of the Engineer-in-Charge being final in this behalf), the CONTRACTOR shall forthwith re-perform, replace, reinstall or re-erect, as the case may be, such works, structure, item or component and no such rejected works structure, item or component shall be reused with reference to the work except with the prior permission of the Engineer-in-Charge or Site Engineer, and the provisions of Clause 5.2.7.0 hereof shall apply to default by the CONTRACTOR of the provisions of this Clause.

5.2.6.0 Notwithstanding anything provided in foregoing clauses hereof and notwithstanding that the Site Engineer and/or Inspector(s) or Inspecting Agency(ies) has/have inspected, tested and/or approved any particular work, structure, item or component, such inspection, test or approval shall not absolve the CONTRACTOR of his full responsibility under the Contract (inclusive of and relative to specification fulfillment and performance guarantees) the said inspection and test procedure being intended basically for the satisfaction of the OWNER that prima facie the erection done and/or materials and components supplied for incorporation in the works is in order.

5.2.7.0 Should the CONTRACTOR fail to remove and/or re-perform replace, reinstall, re-erect as the case may be, any work, structure, material, item or component rejected or found defective in terms of Clause 5.1.4.0 or Clause 5.2.5.0 hereof within such period as the Engineer-in-Charge may specify by written notice to the CONTRACTOR in this behalf, the CONTRACTOR shall be deemed to be in breach of contract within the provisions

of Clause 7.0.1.0 hereof with regard to termination of Contract and associated provisions thereunder and the OWNER and Engineer-in-Charge shall be entitled (without prejudice to any other right or remedy of the OWNER) to remove the rejected/defective works, structure, material, item or component and to re-perform, replace reinstall and/or re-erect, as the case may be, the same by itself or through other agency(ies) or contractor(s) at the risks and costs of the CONTRACTOR in all respects, and recover the costs incurred by the OWNER in this behalf together with a supervision charge of 15% (fifteen percent) thereon admissible to the OWNER, and the OWNER shall be entitled (without prejudice to any other mode of recovery) to deduct the same from the Running Account/Final Bill(s) of the CONTRACTOR or any monies becoming due to the CONTRACTOR from time to time under this or any other Contract.

5.2.7.1 For the purposes of Clauses 5.2.7.0 hereof, the decision of the Engineer-in-Charge on whether the works, structure, material, item or components is/are defective and/or is/are required to be removed and/or re-performed replaced, re-installed and/or re-erected, as the case may be, and as the costs incurred by the OWNER in this behalf, shall be final and binding upon the CONTRACTOR.

5.2.8.0 Without prejudice to and in addition to any other right of inspection, test or examination by the OWNER, before or after the passing and payment of the Final Bill, but before the expiry of the defect liability period, external agencies such as the Chief Technical Examiner of the Central Vigilance Commission shall have the right to technically audit the works. Any defects in the works pointed out by this technical audit group/agency shall be final and binding on the CONTRACTOR, notwithstanding that the Final Bill had been passed and/or paid



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to the CONTRACTOR and notwithstanding that the findings and report of this agency is released after the expiry of the defect liability period. The CONTRACTOR shall be bound to remove the defects pointed out by the technical audit group/agency and to repair/replace the defective works to the satisfaction of the OWNER, and the OWNER shall be entitled to retain in whole or part the Contractor's dues (if the Final Bill has not been paid), or the Security Deposit( if any) remaining in the hands of the OWNER, or to encash in whole or part the Bank Guarantee(s) (if any) remaining in the hands of the OWNER to ensure the fulfillment of the CONTRACTOR's obligations in this regard. The Provisions of Clauses 5.2.7.0 and 5.2.7.1 hereof shall mutatis mutandis apply to such defect(s).

- 5.2.8.1 Should the CONTRACTOR fall to comply with the provisions of Clause 5.2.8.0 hereof, the provisions of Clauses 5.2.7.0 and 5.2.7.1 hereof shall mutatis mutandis apply.
- 5.2.8.2 In case the defects or any of them are such as not to require replacement, the OWNER shall have the right to accept the defective work with suitable reduction in rates/price, as may be determined by the General Manger, for the determination of which the provisions of Clause 2.4.1.2 hereof shall mutatis mutandis apply, for which purpose any reference in Clause 2.4.1.2 to the Engineer-in-Charge shall be deemed to be a reference to the General Manager, and the defective works shall be deemed to be works not covered by the Schedule of Rates/lumpsum price as the case may be. The reduction as determined by the Engineer-in-charge shall be final and binding on the CONTRACTOR.
- 5.2.8.3 Should the money retained by the OWNER pursuant to the provisions of Clause 5.2.8.0 hereof be insufficient to meet the CONTRACTOR's liabilities, the CONTRACTOR shall forthwith on demand by the OWNER pay the shortfall, failing which the CONTRACTOR shall be liable to pay the OWNER interest on the outstanding at the rate of interest applied by the State Bank of India on overdrafts, and the OWNER shall, without prejudice to any other right or remedy available to the

OWNER, be entitled to recover the shortfall from any amount(s) payable or becoming due and payable under any other contract(s).

### **5.3.0.0 FINAL TESTS & POSSESSION OF WORKS**

5.3.1.0 As soon as the works have been completed in all respects to the satisfaction of the Engineer-in-charge or Site Engineer, Final Tests of the works shall be undertaken by the CONTRACTOR at the risks and costs of the CONTRACTOR, in the presence of the Site Engineer or his authorized representative(s). The OWNER may at its discretion permit final test(s) piecemeal in respect of particular part(s) or group(s) of the works or in respect of particular job site(s) involved.

5.3.1.1 The CONTRACTOR and the Site Engineer shall maintain a joint record of all final tests conducted, together with the results thereof, indicating the dates on which each of the said final tests was completed part-wise, component-wise, section-wise, group-wise, plant-wise, system-wise and sub-system wise, as well

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as on the entire works or Unit as a whole.

- 5.3.2.0 The OWNER shall be entitled to take over for operation, any of the various parts, components, sections, groups, plants, systems or sub-systems of the work, on which the respective final tests are completed. The date, on which the final tests on the entire work have been completed, shall be reckoned as the date of completion of the entire work covered by the contract.
- 5.3.2.1 Unless commissioning is included within the scope of work of the CONTRACTOR, in a contract in which the scope of work of the CONTRACTOR includes erection and/or installation of a Plant or Unit or of any equipment, the date of Mechanical Completion thereof recorded by the Engineer-in-charge pursuant to successful final tests under Clause 5.3.1.1 hereof shall be reckoned as date of completion of the work.
- 5.3.3.0 If during Final Tests or prior there to any defect(s) in the design (insofar far as the work may involve any designing on the part of the CONTRACTOR) or in any work performed or structure or component in-stalled or erected or re-installed or re-erected or in any installation or erection or material or other items incorporated in the works, is/are noticed, the CONTRACTOR shall forthwith repair (if it can be repaired) and/or remove and/or demolish the same (if cannot be repaired) and replace, re-install and re- erect the same and otherwise do and provide whatever is necessary to be done or provided to correct repair, and/or rectify the defect(s) to the satisfaction of the Engineer-in-charge, and if the defect(s) be discovered during the Final Tests, the CONTRACTOR shall thereafter repeat the Final Tests or such of them as may be required to be repeated and so on, until the successful conclusion of Final Tests as aforesaid, without any defects in respect of the entire works or Plant or Unit, as the case may be.
- 5.3.3.1 Should the CONTRACTOR fail to correct, repair or rectify any defects as aforesaid, the provisions of Clause 5.2.7.0 and 5.2.7.1 hereof shall mutatis mutandis apply.
- 5.3.4.0 If, by reason of any default on the part of the CONTRACTOR, final tests cannot be conducted in respect of the entire works or for the Plant or Unit (in the case of a Contract which includes within its scope the erection or installation thereof) or for any of the separate part(s), component(s), section(s), group(s), system(s) or sub-system(s) comprised therein, within 30 (thirty) days after the dates fixed for the completion of the entire works covered by the contract under the Progress Schedule or Mechanical Completion of the Plant/Unit, as the case may be, the OWNER shall be entitled, notwithstanding anything provided in Clause 5.3.2.0 hereof and without prejudice to any other rights or remedies of the OWNER and/or the liabilities of the CONTRACTOR under the Contract including (but not limited to ) the rights of the



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OWNER under clauses 4.4.0.0, 7.0.1.0 and associated clauses thereunder, to take over and use the incomplete works or Plant or Unit, as the case may be, with or without affording the CONTRACTOR any further opportunity for completing the works and/or satisfying the requirements of final tests. The taking over and possession or use of the works or Plant or Unit or any part or portion or component, section or group or system or sub-system thereof by the OWNER, under the above provisions shall not be deemed to be an acceptance of the works or Plant or Unit or the relative part, portion, component, section, group, plant, system or sub-system, as the case may be, nor shall relieve the CONTRACTOR of his full obligations in respect thereof under the contract.

- 5.3.5.0 If the CONTRACTOR is permitted to complete and/or conduct final tests for the works or Plant or Unit, or any part of the works or Plant or Unit, as the case may be, after it is taken over under the provisions hereof, this shall be without prejudice to the rights of the OWNER under the contract, including (but not limited to) clauses 4.4.0.0 and 7.0.1.0 and associated clauses thereunder.
- 5.3.5.1 If the CONTRACTOR is permitted to complete and/or conduct final tests for the works or Plant or Unit or any part of the works or Plant or Unit, as the case may be, and the CONTRACTOR is of opinion that such taking over and/or use shall require an extension of time for completion and/or for conducting final tests, the provisions of Clause 4.3.5.0 and associated Clauses thereunder relating to extension of time shall apply.
- 5.3.5.2 If pursuant to action under Clause 5.3.4.0 the CONTRACTOR is not permitted by the OWNER to complete and/or to conduct final tests for the works or Plant or Unit or any part thereof, the incomplete works/Plant/Unit shall be deemed to be a defective work. If the OWNER decides not to exercise its rights under Clause 4.7.4.0 or Clause 7.0.1.0 in respect thereof, then the OWNER shall (without prejudice to any other right which it may have) be deemed to have agreed to accept the defective works subject to a reduction in the applicable rate(s)/lumpsum price(s) as determined by the General Manger, and the provisions of Clause 5.2.8.2 hereof shall mutatis mutandis apply.
- 5.3.6.0 If the Final Tests cannot be completed in respect of the entire work or the Plant/Unit or any part/component/section/group/system/subsystem thereof, for reasons solely attributable to the OWNER, within 30 (thirty) days after the date fixed for completion of the entire Works or Mechanical Completion of the Plant/Unit, as the case may be, under the Progress Schedule, the OWNER shall be entitled to take over and use the works/Plant/Unit pending the completion of the Final Tests by the CONTRACTOR at a later date. If, however, the Final Tests cannot be completed within 6 (six) months of taking over the works/Plant/Unit for reasons solely attributable to the OWNER, the CONTRACTOR's progressive/stage-wise payment, if any, held back specifically for non-completion of the said Final Tests, shall be released to the CONTRACTOR by the OWNER, against a Bank Guarantee for an equivalent amount issued in a form and by a Schedule Bank in India acceptable to the OWNER. This Bank Guarantee shall be kept valid for a period of 6 (six) months from the date of release of payment as aforesaid. If, however, it is still not

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possible to conduct the Final Tests, within the validity period of the aforesaid Bank Guarantee for reasons solely attributable to the OWNER, the requirement of final Tests for the concerned works or Plant/Unit or part/component/section/group/plant system/sub-system thereof, shall stand waived and the said Bank Guarantee will be released to the CONTRACTOR, duly discharged, by the OWNER.

5.3.7.0 The OWNER may, in addition to any other right(s) or power(s) to take over and/or use incomplete or defective works, at any time during the progress of the works, notwithstanding that time for the completion of the entire works or concerned part,

system(s), portion or section thereof according to the Progress Schedule(s) shall not have expired, take over and/or use for any purpose the incomplete or partially completed works or any part, system(s) portion or section thereof, as the case may be, and give the CONTRACTOR an opportunity for completing the work or relative part, system(s) or portion or section thereof, as the case may be, within the time for completion permitted therefor under the Progress Schedule. If in the opinion of the CONTRACTOR, such taking over and/or use require an extension to time for completion, the provision of Clause 4.3.5.0 hereof and associated clauses thereunder relating to extension of time shall apply. Provided always that such taking over, possession or use of the works or any part, system(s), portion or section thereof by the OWNER within the provisions hereof shall not be deemed to be an acceptance of work or relative part, system(s), portion or section thereof by the OWNER or relieve the CONTRACTOR of his full obligations in respect thereof under the CONTRACT.

#### 5.4.0.0 COMMISSIONING AND PERFORMANCE TESTS

5.4.1.0 If commissioning is within the scope of work of a CONTRACTOR engaged inter alia for erection and/or installation of a Plant or Unit, the work shall be deemed not to be complete unless the Plant/Unit is successfully commissioned and handed over to the OWNER for operation.

5.4.2.0 Prior to commissioning the Plant or Unit, the CONTRACTOR shall undertake all operations necessary for start-up of the Plant/Unit to the satisfaction of the Engineer- in-charge.



5.4.3.0 While the OWNER shall provide the utilities required for start-up and commissioning the Plant/Unit and the raw material or feed stock to be processed in the Plant or Unit, the CONTRACTOR shall provide all other inputs and consumables required for start-up and commissioning the Plant/Unit including grease and lubricants and first fill of fuels and oils for the equipment and Machinery.

5.4.4.0 The CONTRACTOR shall provide all personnel required for start-up and supervisory and technical personnel required for commissioning, while the OWNER shall provide operating personnel for commissioning, and shall make and undertake modifications in the Plant/Unit required for successfully commissioning the Plant/Unit. The CONTRACTOR shall not, however, within the scope of the work of erecting and/or installing or commissioning the Plant/Unit be required to supply any material ( other than utilities and consumables)

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required to be incorporated in such modification.

- 5.4.5.0 The Plant/Unit shall be understood to have been successfully commissioned by continuous and established operation upto full capacity for a continuous period of not less than 7 (seven) days. On successful commissioning of Plant/Unit, the Engineer-in-charge shall issue a Commissioning Certificate which shall state the date of completion of commissioning.
- 5.4.6.0 If conduct of Performance Tests falls within the scope of work of a CONTRACTOR engaged inter alia for erection and/or installation of a Plant or Unit, the work shall be deemed not to be complete until successful completion of the Performance Tests.
- 5.4.6.1 Performance tests shall be started when the Unit is stabilized under design conditions. The Plant shall be operated and controlled in accordance with procedures set up beforehand. The performance shall be measured on the basis of the average of data obtained during 72 (seventy two) hours of performance tested under continuous operation of the Unit/ Plant in performance test conditions after the Unit/Plant has been stabilized.
- 5.4.7.0 The CONTRACTOR shall provide technical and supervisory personnel required to conduct the Performance Tests, while the OWNER shall provide all other inputs required for the purpose. The CONTRACTOR shall make and undertake all modifications required to be made in the Plant/Unit to meet the Performance parameters and/or to successfully complete the Performance Tests for the Plant/Unit. The CONTRACTOR shall not, however, within the scope of work of erecting and/or installing or conducting Performance Tests for the Plant/Unit be required to supply any materials (other than utilities and consumables) required to undertake the modifications. The Performance Tests shall be repeated, if necessary, until successful completion of the Performance Tests. On successful completion of the Performance Tests, the Engineer-in-charge shall issue the CONTRACTOR a Performance Test Certificate which shall indicate the dates on which the Performance Tests were conducted and the date(s) of successful completion of the Performance Tests. The provisions of Clause 5.2.6.0 hereof shall mutatis mutandis apply to Performance Tests in the same manner as they apply to Final Tests.
- 5.4.8.0 If during commissioning and/or Performance Tests any defects are discovered in any work performed by the CONTRACTOR or in any erection or installation undertaken by the CONTRACTOR, the CONTRACTOR shall forthwith within the scope of work do and provide all that is necessary to be done or provided to correct, repair and/or rectify the defect(s) to the satisfaction of the Engineer-in-Charge and shall remove or demolish and re-erect or re-install the defective works, if necessary, and shall thereafter continue with the commissioning or repeat the Performance Tests, as the case may be, or such of them as are required to be performed, and so on until successful completion of the Commissioning and/or Performance Tests. Should the CONTRACTOR fail to correct, repair or rectify any defects as aforesaid, the provisions of Clauses 5.2.7.0 and 5.2.7.1 hereof shall mutatis mutandis apply.
- 5.4.8.1(a) If on any testing any material or equipment or the Unit does not meet the design, rated or guaranteed performance relative thereto, the CONTRACTOR shall forthwith within the CONTRACTOR's scope of work and at no additional

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cost to the OWNER undertake such additional tests and/or operations as are necessary to identify the cause of such failure. Such tests and/or operations shall be conducted in conjunction with the Process Licensor, if the Unit as a whole fails to meet the Process Licensor's Guarantees.

(b) If as a result of such tests and/or operations it is determined that the design, rated and/or guaranteed outputs or capacities have not been met because of a defect or deficiency or unsuitability or inadequacy in or of any material(s) (including machines and equipments) supplied by the CONTRACTOR, the CONTRACTOR shall forthwith in consultation with the Engineer-in-Charge take steps necessary to cause the defect/ deficiency/unsuitability/ inadequacy to be identified and rectified, either by replacement of the defective material or part thereof or by repair thereof.

(c) If under any of the provisions hereof, the CONTRACTOR is required to undertake any modification, rectification or replacement, the CONTRACTOR shall for this purpose forthwith establish a Time Schedule acceptable to the Engineer-in-Charge for such modification/replacement/rectification bearing in mind the time exigencies and the Project requirements. Should the CONTRACTOR fail to establish the Time Schedule, the Engineer-in-Charge shall establish the Time Schedule, and the Time Schedule so established shall be binding on the CONTRACTOR.

(d) Should the CONTRACTOR thereafter fail to adhere to a Time Schedule so established for the replacement/rectification, the OWNER may (but without obligation to do so) take over in whole or part such replacement/rectification at the risk and cost of and as agent of the CONTRACTOR. In so doing, the OWNER shall be entitled to identify and employ through private negotiations the quickest available resources of supply and/or work without resorting to the tender process or any other form of

competitive bidding and shall be entitled to recover from the CONTRACTOR, the costs incurred by the OWNER in respect thereof, plus 15% (fifteen percent) supervision charges.

5.4.9.0 The procedure for commissioning the Plant/Unit and/or for conducting Performance Tests shall be as prescribed by the Engineer-in-Charge taking into account the requirements of the manufacturers/Vendors of plant and equipment and the Licensors of the process (es) involved. The CONTRACTOR shall strictly comply with the procedure to ensure strict adherence with the said requirements.

5.4.9.1 Although the CONTRACTOR is not responsible for process guarantees, he shall carry out all activities for collecting the required data during Performance Test runs to identify problems of non-performance for further analysis and modifications required to meet process performance parameters.

#### 5.5.0.0 **COMPLETION CERTIFICATE**

5.5.1.0 After the final tests have been successfully completed in respect of all the works envisaged in the contract, or after the Plant/Unit has been Mechanically completed, as the case may be, the CONTRACTOR shall clear the job site of all scaffolding, wiring, pipes, surplus materials, CONTRACTOR's labour, equipment



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and machinery and shall demolish, dismantle and remove all CONTRACTOR'S site offices and quarters and other temporary works, structures and constructions and other items and things whatsoever brought upon or erected at the job site or any land allotted to the CONTRACTOR by the OWNER and not incorporated in the permanent works and shall remove all rubbish from the job site and the land allotted to the CONTRACTOR and shall clear, level and dress the job site and said land to the satisfaction of the Site Engineer and shall put the OWNER in undisputed custody and possession of the job site and all land allotted by the OWNER to the CONTRACTOR, and unless the CONTRACTOR shall have fulfilled the provisions of the clause, the works shall not be deemed to have been completed, and failing compliance by the CONTRACTOR of the provisions of this clause, the provisions of Clauses 7.0.6.0 and 7.0.7.0 hereof and associated provisions hereunder shall mutatis mutandis apply.

- 5.5.2.0 Upon the satisfactory fulfilment by the CONTRACTOR of the provisions of Clause 5.5.1.0 hereof, the CONTRACTOR shall be entitled to apply to the Engineer-in-Charge, for a Completion Certificate in respect of the entire work or work at any job site, as the case may be, upon submission of the following documents:
- i. The Technical Documents according to which the work was carried out;
  - ii. Complete set of working drawings showing therein corrections and modifications (if any) made during the course of execution of the works, signed by the Engineer-in-Charge;
  - iii. Certificates of final levels as set for various works, signed by the Site Engineer;
  - iv. Records of the final test as maintained jointly and signed by the representative of the CONTRACTOR and the Site Engineer or Mechanical Completion Certificate (if commissioning is not within the CONTRACTOR'S scope of work) and Commissioning Certificate (if Performance Tests are not within the CONTRACTOR'S scope of work) and Performance Test Certificate (if Performance Tests are within the CONTRACTOR'S scope of work).
  - v. Certificate of Site Engineer of satisfactory fulfillment of the provisions of Clause 5.5.1.0 hereof;
  - vi. List of surplus/scrap materials, (out of the materials issued by the OWNER) returned to the OWNER'S Store or otherwise disposed of, duly signed by the Site Engineer;
  - vii. Materials-at-site accounting for OWNER supplied materials, signed by the Site Engineer;
  - viii. Discharge Certificate in respect of OWNER supplied equipment and machinery, signed by the Site Engineer, and
  - ix. Declaration by the CONTRACTOR that he has duly cleared any and all of the dues payable by him to his Labour/Piece rate workers (PRWs), Sub-Contractors, Suppliers, Vendors, Income Tax, Sales Tax, Octroi and Service Tax, Excise and Customs, Provident fund, ESI and royalties, if any.
- 5.5.3.0 If Engineer-in-Charge is satisfied of the completion of the work relative to which the Completion Certificate has been sought and of the completeness in all respects of the Documents specified in Clause 5.5.2.0 hereof, the Engineer-in-Charge shall, within 14 (fourteen) days of receipt of the application for Completion Certificate, issue a Completion Certificate in respect of the said

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work in the format prescribed by the OWNER.

- 5.5.3.1 The issue of a Completion Certificate shall be without prejudice to the OWNER's rights and to the CONTRACTOR's liabilities under the Contract, including the CONTRACTOR's liability for the defect liability period under Clause 5.6.1.0 hereof, nor shall the issue of a Completion Certificate in respect of the works or work at any job site be construed as a waiver of any right or claim of the OWNER against the CONTRACTOR in respect of work or the works at the job site in respect of which the Completion Certificate has been issued.
- 5.5.4.0 Up to and until issue of the Completion Certificate as provided for hereinabove in respect of the work or works at any job site, the relative work(s) shall be and remain at the risks of the CONTRACTOR in all respects, including (but not limited to) accident, fire, lightning, earthquakes, flood, storm, tempest, riot, civil commotion and/or war, except for such works/Plant/Unit or parts, portions, components, sections, groups, systems or sub-systems, which have been taken over by and put to beneficial use by the OWNER, in respect whereof such risks shall pass to the OWNER when the OWNER takes over the same in terms of the Contract.

#### **5.6.0.0 DEFECT LIABILITY PERIOD:**

- 5.6.1.0 The Defect Liability Period for the works (including the materials incorporated therein within the CONTRACTOR's scope of supply) shall unless otherwise specified be 12 (twelve) months from the date of issue of the Completion Certificate.
- 5.6.1.1 The CONTRACTOR shall, at his own cost and initiative, correct, repair and/or rectify any and all defect(s) and/or imperfections in the design of the work (insofar as the CONTRACTOR shall be concerned with the design of the work or any part thereof) and/or in the work performed and/or materials, components or other items incorporated therein within the CONTRACTOR's scope of supply as shall be discovered during the Defect Liability Period and in the event of the CONTRACTOR failing to do so, the provisions of Clauses 5.2.7.0 and 5.2.7.1 hereof shall apply.

### **SECTION - 6**

#### **MEASUREMENTS AND PAYMENTS**

- 6.0.1.0 **FINAL MEASUREMENTS:**
- 6.0.2.0 Within 15 (fifteen) days from the date of completion of Final Test(s) in respect of the works or any portion, section, group or job site, as the case may be, the CONTRACTOR shall cause to be jointly taken with the Site Engineer, final measurements as herein provided for the works covered by the said Final Test(s).
- 6.0.3.0 If the CONTRACTOR fails to apply to the Engineer-in-Charge for final measurements within 15 (fifteen) days from the date of relative final tests



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as specified in Clause

6.0.1.0 hereof, the Site Engineer may, of his own initiative, notify the CONTRACTOR in writing of the date(s) for final measurements. The CONTRACTOR shall be bound to present himself for the measurements on date(s) so notified, failing which the provisions of clause 6.1.4.0 hereof shall apply.

**6.1.0.0 MODE OF MEASUREMENT:**

6.1.1.0 All measurements shall be in the metric system, and except where expressly indicated to the contrary in the Schedule of Rates or other Contract Documents, all measurements shall be taken in accordance with the procedures set forth in the Schedule of Rates, Specifications and other Contract Documents, notwithstanding any provision(s) in the relative standard method of measurement or any other general or local custom to the contrary.

6.1.2.0 In the event of the mode of measurement being not provided for by the Contract Documents in respect of any item of the work, such item of work shall be measured in accordance with the Indian Standard Specification No. 1200 (latest edition) and such other Indian Standard Specifications as may be applicable, and in the event of such item not being covered by the said Indian Standard Specifications, shall be measured in accordance with the method of measurement in this behalf determined by the Engineer-in-Charge, whose decision shall be final and binding upon the CONTRACTOR.

6.1.3.0 All measurements shall be taken jointly by the Site Engineer or his representative on the one hand and the CONTRACTOR or his representative on the other hand and the CONTRACTOR shall be bound to present himself or his authorized representative whenever so required by the Site Engineer, and shall remain present throughout the time required for joint measurements.

6.1.4.0 If the CONTRACTOR absents himself for any reason whatsoever on any date appointed for joint measurements, the joint measurements shall be taken by the Site Engineer in the absence of the CONTRACTOR and the measurements signed by the Site Engineer shall be final and binding upon the CONTRACTOR.

6.1.5.0 Measurements shall be signed and dated on each page by the CONTRACTOR/ CONTRACTOR's representative and Site Engineer/Site Engineer representative. If the CONTRACTOR objects to any of the measurements recorded, including the mode of measurement, such objection shall be noted in the measurement book against the item objected to and such note shall be signed by the CONTRACTOR/CONTRACTOR's representative and Site Engineer/Site Engineer's representative. In the absence of any noted objection as aforesaid, the CONTRACTOR shall be deemed to have accepted the relative measurements as entered in the Measurement Book/Sheets and shall be

barred from raising any objection in respect of any measurements recorded in the Measurement book.

6.1.6.0 All measurements relative to which any objections have been noted in the Measurement Book shall be submitted to the Engineer-in-Charge for his decision, and the decision of the Engineer-in-charge relative thereto (whether

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on the correct measurement to be adopted or on the mode of measurement to be adopted) shall be final and binding upon the CONTRACTOR.

#### 6.2.0.0

#### **FINAL BILL**

#### 6.2.1.0

On the basis of the Final Measurements entered in the Measurement Books/Sheets (the measurements decided by the Engineer-in-Charge upon any objection and/or mode of measurement decided by the Engineer-in-Charge upon any objection being the measurement to be adopted in such event), the CONTRACTOR shall prepare and submit to the Engineer-in-Charge a Final Bill in the prescribed form with reference to the total work covered by the Contract. Such Bills is to be drawn up by applying the applicable rate(s) specified in the Schedule of Rates to the relative measured quantity(ies). Final Bill shall also include the reconciliation or accounting of all materials supplied by or on behalf of the OWNER as free issue material or otherwise.

#### 6.2.1.1

If there is any difference or disputes between the CONTRACTOR and the OWNER as to the item(s) of the Schedule of Rates applicable to any particular supply, work or operation, the decision of the Engineer-in-charge on the applicable item(s) of the Schedule of Rates shall be final and binding upon the CONTRACTOR. If the Engineer-in Charge shall be of the opinion (which opinion shall be final and binding upon the CONTRACTOR) that the disputed supply, work or operation is not covered by any item in the Schedule of Rates or by any other rate fixed pursuant to the provisions hereof, the Engineer-in-charge shall determine the applicable rate(s) in respect thereof according to the provisions of Clause 2.4.1.2 hereof, and the rate(s) so determined by the Engineer-in-charge shall be final and binding on the CONTRACTOR.

#### 6.2.1.2

If the CONTRACTOR has already prepared the Final Bill, the CONTRACTOR shall amend the Final Bill to apply the applicable item(s) of the Schedule of Rates and/or rate(s) as determined by the Engineer-in-charge and if the CONTRACTOR has not prepared the Final Bill, shall prepare the Final Bill accordingly.

#### 6.2.2.0

The Final Bill shall, in addition to the payment entitlements arrived at according to the provisions of Clause 6.2.1.0 hereof and associated clauses above, include in a separate statement annexed thereto the notified claims of the CONTRACTOR as provided for in Clause 6.6.3.0 hereof.

#### 6.2.3.0

The Final Bill drawn in accordance with the provisions hereof shall be submitted to the Engineer-in-charge for certification in quintuplicate (or in such other number of copies as may be prescribed), accompanied by the Completion Certificate relating to the Works.

#### 6.2.3.1



The Engineer-in-Charge shall within 30 days of the receipt of the Final Bill drawn in accordance with the provisions hereof proceed to check, correct and certify the Final Bill and shall forward the corrected and certified Final Bill to the OWNER for scrutiny and payment together with the Completion Certificate, and shall send to the CONTRACTOR for his information a copy of the Final Bill as corrected and certified.

#### 6.2.4.0

All monies payable under the Contract shall become due to the CONTRACTOR only after submission to the OWNER of the certified Final Bill accompanied by the Completion Certificate in respect of the works.

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- 6.2.5.0 Payment of the amount(s) due on the Certified Final Bill to the extent admitted by the OWNER shall be made within 90(ninety) days from the date of its certification by the Engineer-in-charge.
- 6.2.5.1 The payment to the CONTRACTOR on the Final Bill shall be subject to deduction of retention money(ies), balance security deposits and other claims, if any, as well as income tax as provided under section 194-C of the Income Tax Act and such other taxes and deductions as provided for under any law, rule or regulation having the force of law for the time being applicable (including any hold ups directed or necessitated by Court Orders or Orders of any Tribunal or other statutory authority and/or of the Vigilance Commission).
- 6.2.6.0 The OWNER may authorize the Engineer-in-charge and/or any other person(s) to commence a dialogue with the CONTRACTOR for arriving at a settlement of the notified claims of the CONTRACTOR annexed to the Final Bill as provided in Clause 6.6.3.0 hereof.
- 6.2.6.1 If a settlement is negotiated with the CONTRACTOR in respect of such claims and such settlement is approved by the OWNER, the CONTRACTOR shall submit a Supplementary Final Bill to the OWNER drawn in terms of the said settlement, and the provisions of Clause 6.2.3.1 and associated clauses thereunder shall mutatis mutandis apply to such Supplementary Final Bill.
- 6.2.6.2 Payment of the amount due on the Supplementary Final Bill to the extent admitted by the OWNER shall be made within 90 (ninety) days from the date of its certification by the Engineer-in-Charge.
- 6.3.0.0 SCHEDULE OF RATES:**
- 6.3.1.0 The remuneration determined due to the CONTRACTOR, under the provision of Clause 6.2.2.0 hereof shall constitute the entirety of the remuneration and entitlement of the CONTRACTOR in respect of the work(s) under the Contract, and no further or other payment whatsoever shall be or become due or payable to the CONTRACTOR under the Contract.
- 6.3.2.0 Without prejudice to the generality of the provisions of Clause 6.3.1.0 hereof, the Schedule of Rates shall be deemed to include and cover:
- (i) All costs, expenses outgoings and liabilities of every nature and description whatsoever and all risks whatsoever (foreseen or unforeseen) to be taken or which may occur in or relative to the execution, completion, testing and/or handing over the work to the OWNER and/or in or relative to acquisition, loading, unloading, transportation, storing, working upon using converting fabricating, erecting any item, equipment, material or component in or relative to the works and the CONTRACTOR shall be deemed to have known the nature, scope, magnitude and the extent of the works and items, materials, utilities, consumables, equipment, and components and work, labour and services required for the proper and complete execution of the works though the Contract Documents may not fully and precisely set out, describe or specify them; and the generality hereof shall not be deemed to be anywise limited, restricted or abridged because in certain cases, the Contract Documents or any of them shall or may and/or in other cases, they shall or may not expressly

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state that the CONTRACTOR shall do or perform any particular work, labour or service or because in certain cases, the Contract Document state a particular work, operation, supply, labour or service shall be performed/made by the CONTRACTOR at his own cost or without additional payment, compensation or charge or without entitlement of claim against the OWNER or words to similar effect, and in other cases, they do not do so or



because in cases it is stated that the same are included in or covered by the Schedule or Rates and in other cases, it is not so stated;

(ii) The cost of all constructional plant, equipment, supply of water and power, construction of temporary roads and access, temporary works and facilities, pumps, wiring, pipes, scaffolding, shuttering, and other materials, supervision, labour, insurance, fuel, stores, spares, supplies, appliances and other materials, items, articles and things whatsoever (foreseen or unforeseen) to be supplied, provided or arranged by the CONTRACTOR in or relative to or in connection with the performance and/or execution of each item specified in the Schedule of Rates and any related or incidental works or operations by expression or implication involved therein or incidental thereto, complete in every aspect in accordance with Contract Documents, and the plan(s), drawing(s), design(s), order(s) and/or instruction(s).

(iii) The cost of royalties, licence fees, charges, duties, penalties, levies and damages whatsoever payable for or in respect of any protected or patented goods, materials, equipment or processes employed in or relative to the works and all rents, royalties, licence fees and any other fee, duty, penalty, levy, loss or damage payable on the excavation, removal or transportation of any material or acquisition or use of any right of way or other rights, licences, permits, privileges or usages required for or relative to the performance of the works;

(iv) Customs duties, excise duties and other duties, sales tax on sale or purchase or turnover or on Works Contract or otherwise and other direct and indirect taxes, quay and port dues or charges and all other duties, taxes, fees, charges, levies octroi and/or cesses whatsoever imposed by the Central Government or State Government or Municipal or Local Bodies and other Authorities whatsoever payable on any materials and/or works imported, exported, transported, supplied or performed (including materials incorporated in the works or brought to site for the performance of the work) without any entitlement to the CONTRACTOR for any exemption, remission, refund or reduction thereof.

(v) The cost of all indemnities to the OWNER and insurance premia on insurance required in terms of the Contract Documents under any law, rule or regulation, or otherwise taken out by the CONTRACTOR and the cost of all risks whatsoever (foreseen or unforeseen) including but not limited to risks of delay or extension of time or reduction or increase in the work or scope of work and/or cancellation of Contract and/or accidents, strike, civil commotion, war, labour trouble, third party breach, fire, lightning, inclement weather, storm, tempest, flood, earthquake and other acts of God, Government regulation or

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imposition or restriction, dislocation of road, rail and other transport, access or facilities, flooding of site and/or access roads or approaches thereto, suspension of work, sabotage and other cause whatsoever.

(vi) The cost of all material supplied to the OWNER and/or intended for incorporation in the works delivered to the job site and stacked as instructed by the Engineer-in-charge including (but not limited to) loading, transportation and unloading thereof, waste or materials and returns and disposal of waste and of empties; and

(vii) All supervision charges, establishment overheads, finance charges and other costs and expenses of and charges to the CONTRACTOR, and CONTRACTOR's profit of and relative to the work.

6.3.3.0 The rates stated in the Schedule of Rates shall not be subject to escalation or increase on any account whatsoever.

#### 6.4.0.0 ON ACCOUNT PAYMENT AND ADVANCES:

6.4.1.0 Without prejudice to the provision of Clause 6.2.4.0 hereof, the OWNER may at its discretion by way of assistance to the CONTRACTOR, make 'on account' payments to the CONTRACTOR, during the progress of the work on the basis of Running Account Bills as hereinafter more specifically mentioned.

6.4.1.1 Monthly or otherwise as the Engineer-in-charge may specify in this behalf, the CONTRACTOR shall make a quantitative assessment of the work performed by CONTRACTOR at each job site during the preceding month or other specified period and submit a Running Account Bill (in the form prescribed by the OWNER) in quintuplicate to the Site Engineer of the work during the said month/period with detailed measurements thereof, the said Running Account Bill(s), to be drawn by applying unit quantities measured to the applicable item(s) in the Schedule or Rates. The Engineer-in-Charge shall thereafter have summary verification undertaken of the work and quantities entered in the Running Account Bill(s) and shall certify the Running Account Bill(s) for payment on basis of such verification.

6.4.1.2 Running Account Bills as specified in Clause 6.4.1.1 hereof may be drawn by the CONTRACTOR every alternate month, and an adhoc payment made by the OWNER in respect of the intervening month for the amount certified by the Engineer-in-Charge on the basis of a summary assessment made by the Engineer-in-Charge of the value performed by the CONTRACTOR during the intervening month, such adhoc payment(s) to be deducted from the amount(s) certified by the Engineer-in-Charge as payable on the Running Account Bill(s) thereafter following.

6.4.1.3 Where the Contract stipulates a lump sum as payable for the work or where a lump sum rate is stipulated in the Schedule of Rate(s) or otherwise in respect of any particular work or part thereof and the works are not, at any intervening stage, capable of measurement, the Running Account Bill to be prepared by the CONTRACTOR according to the provisions of Clause 6.4.1.1 hereof shall be prepared on the basis of a value assessment of such work as certified by the



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Engineer-in-charge, as percentage of the entire work or item of work for which the lump sum rate is stipulated.

6.4.1.4 No running Account Bill(s) shall be made and/or certified for a total value of less than Rs. 25,000/- (Rupees twenty five thousand only) unless otherwise expressly agreed.

6.4.2.0 All on account payments shall be subject to deduction therefrom of all dues to the OWNER, retention monies and other deductions provided for in the Contract, and taxes and other monies, deductible within the provisions of Section 194-C of the Income Tax Act or any other law, rule or regulation for the time being in force.

6.4.3.0 All on account payments shall be regarded merely as advance payments against the amount which will become due to the CONTRACTOR in terms of the Contract, and any such payments shall be without prejudice to the full rights of the OWNER under the Contract and to the liabilities of the CONTRACTOR thereunder, and specifically shall not be regarded as an acceptance or completion of any work(s) paid for in terms of any Running Account Bill or otherwise, notwithstanding any verification or certification by the Engineer-in-Charge in respect thereof.

6.4.3.1 The Schedule of Rate item(s) applied by the CONTRACTOR in respect of any work in his Running Account Bill(s) and the acceptance thereof by the Engineer-in-Charge, while verifying and certifying the bill for payment in respect of such work or otherwise in certifying any payment within the provisions aforesaid shall not be deemed to be binding upon the OWNER as determining the applicable Schedule of Rate item(s) and

shall be without prejudice to the rights of the OWNER within the provisions of Clause 6.2.1.1 hereof.

6.4.4.0 Unless or until an extension of time has been granted by the Engineer-in-charge under Clause 4.3.5.0 hereof or by the OWNER under Clause 4.3.6.0 hereof on account payments made under Running Account Bills raised by the CONTRACTOR for the works executed after the expiry of the date of final completion of the works under the approved Progress Schedule, shall be subject to provisional withholding of an amount towards adjustment by way of discount in the price calculated as per provisions of Clause 4.4.2.0 hereof. The amount so withheld shall be adjusted towards the Price Adjustment (if any) finally determined after completion of the works. As an alternative, the CONTRACTOR shall have an option to provide a Bank guarantee from a schedule bank and in a format acceptable to the OWNER for a sum equal to 10% (ten percent) of the total contract value which shall be available for recovery of the Price Discount (if any) finally determined after completion of the works. This Bank guarantee shall be in addition to any other guarantee to be provided by the CONTRACTOR and shall be valid for a period of not less than 12 (twelve) months from the date of final completion of the works.

6.4.5.0 In Contracts of a Total Contract value of Rs. 50 lakh (Rupees fifty lakh only)



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and above, the CONTRACTOR may (if specified by him in his bid and accepted by the OWNER) be allowed a Mobilization advance for an amount equivalent to upto 10%(ten per cent) of the Total Contract Value, subject to the fulfilment of the following conditions:

- a) The CONTRACTOR shall have signed and sent back a copy (or copies if so required) or the Acceptance of tender issued by the OWNER in token of unqualified acceptance thereof.
- b) The CONTRACTOR shall have executed the formal contract in terms of the Form of Contract.
- c) The CONTRACTOR shall have made a formal application for the release of the Mobilization Advance and shall have furnished a Bank Guarantee to cover the Mobilization Advance from a Bank in a format approved by the OWNER.
- d) The outstanding balance of the Mobilization Advance shall carry interest at 1% (one percent) above the prevailing SBI Prime Lending rate.
- e) Without prejudice to any other mode of recovery available to the OWNER, the Mobilization Advance, together with interest thereon calculated on the reducing balance, may be recovered at the rate of prevailing **SBI Prime Lending Rate ( PLR ) plus one percent** of the gross amount certified against each Running Account Bill, till the advance, together with the interest accrued thereon, is recovered in full. The unrecovered balance if any, and interest may be recovered from the Final Bill of the CONTRACTOR and/or from any other amount due to the CONTRACTOR under any other contract or otherwise.
- f)(i) If the OWNER is satisfied that 25% (twenty five per cent) of the Mobilization Advance and interest accrued till then on the Mobilization Advance has been repaid to or recovered by the OWNER, the OWNER may on the application of the CONTRACTOR, if the Bank Guarantee submitted by the CONTRACTOR covers and secures only the Mobilization Advance, permit the CONTRACTOR to substitute the Bank Guarantee by a Bank Guarantee acceptable to OWNER for an amount reduced by 25% (twenty five per cent).
- (ii) The provisions of paragraph, (i) hereof above, shall mutatis mutandis apply to the OWNER's satisfaction that the CONTRACTOR has repaid 50% (fifty per cent) and/or 75% (seventy five per cent), as the case may be, of the Mobilization Advance, and interest upto then accrued till then on the Mobilization Advance.

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g) All other conditions stipulated in Clause 2.1.2.0 hereof shall be applicable to the advance(s).

6.4.6.0 In addition, the OWNER may, at its discretion, allow Secured Advance(s) to the CONTRACTOR, against imperishable materials brought to site for incorporation in the permanent works. Such Secured Advance(s) shall be governed by the following conditions:

- (a) The decision of the owner as to whether or not to grant a Secured Advance and as to what materials, if any, are imperishable for the grant of Secured Advance and/or as to what has to be done to qualify any particular material for the grant of Secured Advance shall be final and binding on the CONTRACTOR.
- (b) The Secured Advance shall be limited to lower of the following:
  - (i) 75% (Seventy Five Percent) of the value of the imperishable material brought to site for permanent incorporation in the works as assessed by the Engineer-in Charge, who may call for (but shall not be bound by) the voucher(s)/invoices for any such material from the CONTRACTOR, who shall forthwith comply with the same;
  - (ii) 90% (Ninety percent) of the concerned item rate for the work in which the material is to be incorporated as set out in the Schedule of Rates.
- (c) The Secured Advance shall be recovered from the subsequent Running Account bill(s) of the CONTRACTOR, to the extent as determined by the Engineer-in- Charge (whose decision shall be final and binding upon the CONTRACTOR) that the materials covered by the Secured Advance are used up in or the work(s) covered by the bill(s).
- (d) Upon payment/disbursement by the OWNER to the CONTRACTOR or any supplier of the CONTRACTOR of any Secured advance with respect to any materials, the ownership of the said materials shall forthwith vest in the OWNER as security for the repayment of the said advance(s) without necessity of any further act, deed matter or thing, and the said materials shall be deemed to be OWNER supplied materials entrusted to the CONTRACTOR for permanent incorporation in the works and the provisions of Clause 3.2.1.0 hereof (including sub clauses (a) to (t) thereof shall mutatis mutandis apply thereto in the same manner as they apply to other OWNER supplied materials, AND before payment/disbursement of any secured advance by the OWNER pursuant hereto the CONTRACTOR and the Engineer-in-charge shall jointly sign a Statement setting out and detailing the materials(s) with reference to which the advance has been reckoned, title to which shall vest in the OWNER pursuant to the provisions hereof.
- (e) Notwithstanding anything provided in sub-clause (c) hereof above, the OWNER shall be entitled (without prejudice to any other right or remedy available to the OWNER) by written notice to the CONTRACTOR to recall the advance or the outstanding balance thereof in the circumstances set out in Clause 6.4.8.0 hereof or if the OWNER is of the opinion that by virtue

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of delay by the CONTRACTOR in the execution or completion of the work or for any other cause, the value of the remaining material against which the advance has been paid is insufficient to adequately secure the outstanding balance of the advance and interest payable thereon or if allowed to continue will become inadequate to secure the same. Should the CONTRACTOR upon such notice fail to repay the OWNER the outstanding balance of the said advance, it will be open to the OWNER without

further reference or notice to the CONTRACTOR to sell in whole or part(s) the materials referred to in sub-clause (d) hereof above by private contract or public tender or a combination thereof or otherwise as the OWNER deems fit, and for the purpose to exercise all powers and to sign and do all acts, deeds, matter and things as are set out in Clause 7.0.6.0 hereof, and the provisions of the said clause shall mutatis mutandis apply to such materials in the same manner as they apply to scaffolding, wiring, pipes, surplus and other materials, equipment and machinery covered by the said Clause.



6.4.7.0 Nothing provided in the foregoing clauses hereof shall anyway be deemed to confer any rights or entitlement on the CONTRACTOR to receive on account payments or Advance payments of any kind whatsoever, nor shall any failure or delay by the OWNER to make any advance or on account payment(s) as herein envisaged or otherwise afford the CONTRACTOR a ground or basis for extension of time for completion or otherwise relieve the CONTRACTOR from any of its/his liabilities under the Contract, it being clearly understood that these on account payments or advance payments are only by way of assistance to the CONTRACTOR.

6.4.8.0 The Mobilization Advance and the materials covered by the Secured Advance shall be utilized by the CONTRACTOR solely for and in the execution of the Contract and for no other purpose, and the CONTRACTOR shall satisfy the OWNER/Engineer-in-charge in this regard whenever required. If it is found that any of the advance(s) or materials aforesaid have been utilized by the CONTRACTOR in whole or part for any other purpose or if the Contract is for any reasons cancelled or terminated, the OWNER may at its discretion recall the said advances or the unrecovered portion(s) thereof, as the case may be, and without prejudice to any other right or remedy available to the OWNER, recover the same by recourse to any Bank Guarantee to which the OWNER may have recourse for the purpose.



#### 6.5.0.0 **MODE OF PAYMENT**

6.5.1.0 All payment(s) by the OWNER under or in terms of the Contract shall be made in official Indian currency only by crossed "Account Payee" cheque sent to the registered office of the CONTRACTOR or other office notified in this behalf by the CONTRACTOR or delivered to his authorized representative. All cheques drawn shall be payable at the office of the OWNER's bankers and in no case will the OWNER be responsible if the cheque is mislaid, misappropriated or otherwise lost or stolen.

#### 6.6.0.0 **CLAIMS BY THE CONTRACTOR**

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- 6.6.1.0 Should the CONTRACTOR consider that he is entitled to any extra payment or compensation in respect of the works over and above the amounts due in terms of the Contract as specified in Clause 6.3.1.0 hereof or should the CONTRACTOR dispute the validity of any deductions made or threatened by the OWNER from any Running Account Bills, the CONTRACTOR shall forthwith give notice in writing of his claim in this behalf to the Engineer-in-charge and the Site Engineer within 10 (ten) days from the date of the issue of orders or instructions relative to any works for which the CONTRACTOR claims such additional payment or compensation or of the happening of the event upon which the CONTRACTOR basis such claim, and such notice shall give full particulars of the nature of such claim, grounds on which it is based, and the amount claimed. The OWNER shall not anyway be liable in-respect of any claim by the CONTRACTOR unless notice of such claim shall have been given by the CONTRACTOR to the Engineer-in-charge and the Site-Engineer in the manner and within the time aforesaid and the CONTRACTOR shall be deemed to have waived any
- and all claims and all his rights in respect of any claim not notified to the Engineer-in-charge and the Site Engineer in writing in the manner and within the time aforesaid.
- 6.6.2.0 The Engineer-in-Charge and/or the Site Engineer shall be under no obligation to reply to any notice of claim given or claim made by the CONTRACTOR within the provisions aforesaid or otherwise or to reject the same and no omission or failure on the part of the Engineer-in-charge or Site Engineer to reject any claim made or notified by the CONTRACTOR or delay in dealing therewith shall be deemed to be an admission by the OWNER of the validity of such claim or waiver by the OWNER of any of its rights in respect thereof, with the intent that all such claims otherwise valid within the provisions of Clause 6.6.1.0 read with Clauses 6.6.3.0 and 6.6.3.1 shall be dealt with/considered by the OWNER at the time of submission of the Final Bill.
- 6.6.3.0 Any claims of the CONTRACTOR notified in accordance with the provision of Clause 6.6.1.0 hereof as shall remain at the time of preparation of Final Bill by the CONTRACTOR shall be separately included in the Final Bill prepared by the CONTRACTOR in the form of a Statement of Claims attached thereto, giving particulars of the nature of the claims, grounds on which it is based, and the amount claimed and shall be supported by a copy(ies) of the notice(s) sent in respect thereof by the CONTRACTOR to the Engineer-in-Charge and Site-Engineer under Clauses 6.6.1.0 hereof. In so far as such claim shall in any manner or particular be at variance with the claim notified by the CONTRACTOR within the provision of Clause 6.6.1.0 hereof, it shall be deemed to be a claim different from the notified claim with consequence in respect thereof indicated in Clause 6.6.1.0 hereof, and with consequences in respect of the notified claim as indicated in Clause 6.6.3.1 hereof.
- 6.6.3.1 The OWNER shall not anyway be liable in respect of any notified claim not specifically reflected in the Final Bill in accordance with the provisions of Clause 6.6.3.0 hereof and any and all notified claims not specifically reflected and included in the Final Bill in accordance with the provisions of Clause 6.6.3.0 hereof shall be deemed to have been waived by the CONTRACTOR. Further the

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OWNER shall have no liability in respect thereof and the CONTRACTOR shall not be entitled to raise or include in the Final Bill any claim(s) other than a notified claim conforming in all respects and in accordance with the provisions of Clause 6.6.3.0 hereof.

- 6.6.4.0 No claim(s) shall on any account be made by the CONTRACTOR after the Final Bill, with the intent the Final Bill prepared by the CONTRACTOR shall reflect any and all notified claims whatsoever of the CONTRACTOR against the OWNER arising out of or in connection with the Contract or work performed by the CONTRACTOR thereunder or in relation thereto, and the CONTRACTOR shall notwithstanding any enabling provision under any law or Contract and notwithstanding any right of claim in quantum meruit that the CONTRACTOR could have in respect thereof, be deemed to have waived any and all such claims not included in the Final Bill and to have absolved and discharged the OWNER from and against the same, even if in not including the same as aforesaid, the CONTRACTOR shall have acted under a mistake of law or fact.
- 6.6.5.0 Notwithstanding the existence of any claim by the CONTRACTOR in terms hereof or otherwise, the CONTRACTOR shall continue and be bound to continue and perform the works to completion in all respects according to the Contract (unless the Contract or works be priorly determined by the OWNER in terms hereof) and shall remain liable and bound in all respects under the Contract.
- 6.6.6.0 The payment of any sum on account to the CONTRACTOR during the performance of any work or item of work in respect of which a claim has been notified by the CONTRACTOR in terms of Clause 6.6.1.0 hereof or the making or negotiation of any

interim arrangements in respect of the performance of such work or item of work by the OWNER, shall not be deemed to be an acceptance of the related claim by the OWNER, or any part or portion thereof with the intent that any such payment shall constitute merely an interim facility or interim assistance to the CONTRACTOR, and not an obligation upon the OWNER.

#### 6.7.1.0 DISCHARGE OF OWNER'S LIABILITY

- 6.7.2.0 The acceptance by the CONTRACTOR of any amount paid by the OWNER to the CONTRACTOR in respect of the final dues of the CONTRACTOR under the Final Bill upon condition that the said payment is being made in full and final settlement of all said dues to the CONTRACTOR shall, without prejudice to the notified claims of the CONTRACTOR included in the Final Bill in accordance with the provisions under Clause 6.6.3.0 hereof and associated provisions thereunder, be deemed to be in full and final satisfaction of all such dues to the CONTRACTOR notwithstanding any qualifying remarks, protest or condition imposed or purported to be imposed by the CONTRACTOR relative to the acceptance of such payment, with the intent that upon acceptance by the CONTRACTOR of any payment made as aforesaid, the Contract (including the arbitration clause) shall, subject to the provision's of Clause 6.8.2.0 hereof, stand discharged and extinguished except in respect of the notified claims of the CONTRACTOR included in the Final Bill and except in respect of the



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CONTRACTOR's entitlement to receive the unadjusted portion of the Security Deposit in accordance with the provisions of Clause 6.8.3.0 hereof on successful completion of the defect liability period.

6.7.3.0 The acceptance by the CONTRACTOR of any amount paid by the OWNER to the CONTRACTOR in respect of the notified claims of the CONTRACTOR included in the Final Bill in accordance with the provisions of Clause 6.6.3.0 hereof and associated provisions thereunder, upon the condition that such payment is being made in full and final settlement of all the claims of the CONTRACTOR shall, subject to the provisions of Clause no. 6.7.3.0 hereof, be deemed to be in full and final satisfaction of all claims of the CONTRACTOR notwithstanding any qualifying remarks, protest or condition imposed or purported to be imposed by the CONTRACTOR relative to the acceptance of such payment with the intent that upon acceptance by the CONTRACTOR of any payment made as aforesaid, the Contract (including the arbitration clause) shall stand discharged and extinguished insofar as relates to and/or concerns the claims of the CONTRACTOR.

6.7.4.0 Notwithstanding anything provided in Clause 6.7.1.0 and/or Clause 6.7.2.0 hereof the CONTRACTOR shall be and remain liable for defects in terms of Clause 5.6.0.0 hereof and for indemnity to the OWNER in terms of clause 6.8.2.0, and shall be and remain entitled to receive the unadjusted balance of the Security Deposit remaining in the hands of the OWNER in terms of Clause 6.8.3.0 hereof.

**6.8.0.0 FINAL CERTIFICATE**

6.8.1.0 After the expiry of the defect liability period as provided for in clause 5.6.0.0 hereof and after all the liabilities of the CONTRACTOR in respect of the Contract have been satisfied, the OWNER or the Engineer-in-Charge, shall on the Application of the CONTRACTOR, issue a Final Certificate to the CONTRACTOR, certifying that the CONTRACTOR has performed all his obligations in respect of the defect liability period in terms of clause 5.6.1.1 hereof.

6.8.2.0 Upon Application for the Final Certificate, the CONTRACTOR shall be deemed to have warranted that it/he has fully paid and satisfied all claims for work, labour, materials,

supplies, equipment and all other liabilities whatsoever touching or affecting the Contract, and to have undertaken to indemnify and keep indemnified the OWNER from and against all claims, demands, debts, liens, obligations and liabilities whatsoever arising therefrom or relating thereto and upon issue of the Final Certificate, the CONTRACTOR shall be deemed to have released, acquitted and discharged the OWNER from and against all claims (known or unknown), liens, demands or causes of action of any kind whatsoever arising out of or relating to the Contract or otherwise howsoever touching or affecting the same and to have undertaken to indemnify and keep indemnified the OWNER from and against the same.

6.8.3.0 Within 15 (fifteen) days of Application made by the CONTRACTOR in this behalf accompanied by the Final Certificate, or within 15 (fifteen) days of the passing of the CONTRACTOR's Final Bill by the OWNER, whichever shall be later, the



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OWNER shall pay/refund to the CONTRACTOR the unadjusted balance (if any) of the Security Deposit for the time being remaining in the hands of the OWNER, and upon such payment/refund, the OWNER shall stand discharged of all obligations and liabilities to the CONTRACTOR under the Contract.

#### 6.9.0.0 CLAIMS OF OWNER:

- 6.9.1.0 No release or payments of any unadjusted balance of the Security Deposit by the OWNER to the CONTRACTOR as aforesaid or otherwise shall be deemed or treated as a waiver of any right(s) or claim(s) of the OWNER or shall stop or prevent the OWNER from thereafter making or enforcing any claims or any rights against the CONTRACTOR. The claims of the OWNER, if any, against the CONTRACTOR shall continue to survive and shall not get extinguished notwithstanding the issue of Final Certificate and/or the release of Security Deposit to the CONTRACTOR.
- 6.9.2.0 If and where the Contract requires the CONTRACTOR to pass or pay to the OWNER any MODVAT/CENVAT or like benefit(s), or if the OWNER is required in terms of the Contract to pay, bear or reimburse any excise, customs or like duties or sales or other taxes, the CONTRACTOR shall on receiving any such benefit(s) or on obtaining or being granted any exemption, refund, rebate, set-off or draw-back of any such duty or tax, as the case may be, forthwith pay and pass on to the OWNER the full amount or value thereof; and if the CONTRACTOR fails to pass on or pay to the OWNER the full amounts of the said benefit(s) available to the OWNER, or the full amount or value of such exemption refund, rebate, set-off, or draw-back of any such duty or tax as the case may be, the CONTRACTOR shall be liable, to pay interest thereon @ 16% (sixteen percent) per annum from the date the same is received or obtained by or granted to the CONTRACTOR, and OWNER shall, without prejudice to the generality of the foregoing, be entitled to claim and recover the same from the CONTRACTOR as and when the OWNER derives knowledge thereof, together with interest as aforesaid.

## SECTION - 7

### TERMINATION

#### 7.0.0.0 TERMINATION:

- 7.0.1.0 Notwithstanding anything elsewhere herein provided and in addition to any other right or remedy of the OWNER under the Contract or otherwise (including the right of the OWNER to claim price discount due under the provisions of Clause 4.4.0.0 hereof or otherwise), the OWNER shall be entitled to terminate the Contract by written notice at

any time during the currency on or after the occurrence of any one or more of the following events or contingencies, namely:

- (i) Default or failure by the CONTRACTOR of any of the obligations of the CONTRACTOR under the Contract, including but not limited to :

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- (a) Failure to start the work within 10 (ten) days of handing over the job site to the CONTRACTOR, and in the event of more than one job site being involved, failure to start the work at each job site involved within 10 (ten) days of handing over of the concerned job site to the CONTRACTOR;
- (b) Failure to commence any work at any job site in accordance with the time prescribed in this behalf in the Progress Schedule;
- (c) Failure to carry out on the works or any item to meet the Progress Schedule;
- (d) Failure to provide at each job site sufficient labour, material, equipment, machinery, temporary work and/or facilities required for the proper and/or due execution of the work or any part thereof;
- (e) Failure to execute the works or any item in accordance with the Contract;
- (f) Disobedience of any order or instruction of the Engineer-in-Charge and/or Site Engineer;
- (g) Negligence in carrying out the works or carrying out of work found to be unsatisfactory by the Engineer-in-Charge;
- (h) Abandonment of the works or any part thereof;
- (i) Suspension of the entire works or any part thereof, for a period of 14 (fourteen) days or more without due authority from the OWNER or Engineer-in-Charge.
- (j) Commission, permission or sufferance of any other breach of any of the terms, conditions or provisions of the Contract on the part of the CONTRACTOR to be paid, performed and/or observed;
- (k) Failure to deposit the Security Deposit within 30 (thirty) days of receipt by the CONTRACTOR of Acceptance of Tender;
- (l) Failure to execute the Contract in terms of the Form of Contract forming part of the Tender Documents within 30 (thirty) days of notice in this behalf from the OWNER.
- (ii) If the CONTRACTOR is incapable of carrying out the work;
- (iii) If the CONTRACTOR misconducts himself in any manner
- (iv) If there is any change in the constitution of the CONTRACTOR (if a firm) or in the circumstances or organization of the CONTRACTOR, which is detrimental to the interests of the work or the OWNER;
- (v) Dissolution of the CONTRACTOR (if a firm) or commencement of liquidation or winding up (whether voluntary or compulsory) of the CONTRACTOR (if a company) or appointment of a receiver or manager of any of the CONTRACTOR's assets and/or insolvency of the CONTRACTOR (if a sole proprietorship) or any Partner of the CONTRACTOR (if a firm);
- (vi) Distress, execution or other legal process being levied on or upon any of the CONTRACTOR's goods and/or assets;
- (vii) Death of a CONTRACTOR (if an individual);


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- (viii) If upon any change in the partnership/constitution of a Contractor's organization (if a Partnership), the OWNER shall refuse to continue the contract with the re-constituted firm;
- (ix) If the CONTRACTOR or any person employed by him shall make or offer for any purpose connected with the Contract any gift, gratuity, royalty, commission, gratification or other inducement (whether money or in any other form) to any employee or agent of the OWNER;
- (x) If the CONTRACTOR shall sub-contract the whole or any part of the work in contravention of the provisions of Clause 4.8.1.0 hereof or the CONTRACTOR shall assign or attempt to assign his interest or any part thereof in the Contract.

- 7.0.1.1 The decision of the General Manager, as to whether any of the events/contingencies mentioned in Clause 7.0.1.0 hereof, entitling the OWNER to terminate the Contract, has occurred or not, shall be final and binding upon the CONTRACTOR.
- 7.0.2.0 The notice of termination shall set forth, in addition to a statement of the reasons(s) for terminating the contract, the time(s) and place(s) for conducting a survey and measurement of the work performed under the Contract up to the date of termination for the purpose of determining the final amount(s) due to the CONTRACTOR therefor. The reason(s) for the termination stated in the notice of termination, shall be final and binding upon the CONTRACTOR.
- 7.0.3.0 For the purpose of measurements, the provisions of Clause 6.1.1.0 to 6.1.6.0 hereof shall apply. Only completed items of the work shall be reckoned for the purpose of measurements and the decision of the Engineer-in-Charge as to whether or not any items of works have been completed for the purpose of measurement shall be final and binding upon the CONTRACTOR. Incomplete items of works shall be measured only on the basis of materials supplied and the decision of the Engineer-in-Charge as to the quantity of material involved in or relative to any incomplete works, shall be final and binding upon the CONTRACTOR.
- 7.0.4.0 For the purpose of determining the amount due to the CONTRACTOR in respect of the work, the provisions of Clauses 6.2.1.0, 6.2.1.1., 6.2.1.2, 6.2.2.0 and 6.3.1.0 shall apply, and the measurements taken shall for the purpose of such accounting be deemed to be final measurements and the bill prepared by the CONTRACTOR on the basis thereof shall be deemed to be the final bill and no other amount(s) shall be due to the CONTRACTOR in respect thereof, subject to the provisions of Clause 6.6.0.0 and associated clauses thereunder with regard to claims of the CONTRACTOR.
- 7.0.5.0 Within 7 (seven) days of completion of the measurements, the CONTRACTOR shall clear the job site of all scaffolding wiring, pipes, surplus materials, CONTRACTOR's labour, equipment and machinery and shall demolish, dismantle and remove all CONTRACTOR's site offices and quarters, and other temporary works, structures and construction and other items and things whatsoever brought upon or erected at the job site or on any land allotted to the contractor by the OWNER and not incorporated in the permanent works and shall remove all rubbish from the job site and the land allotted to the CONTRACTOR and shall clear, level and dress the job site and said


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land to the satisfaction of the Engineer-in-Charge and shall put the OWNER in undisputed custody and possession of the job site and all land allotted by the OWNER to the CONTRACTOR.

- 7.0.6.0 Should the CONTRACTOR fail to comply, with provision of Clause 7.0.5.0 hereof in the manner and within the time specified therein, the OWNER shall have the right at the risks and costs of the CONTRACTOR in all respects to clear the job site of all scaffolding, wiring, pipes, surplus materials, CONTRACTOR's labour, equipment and machinery and other

materials and things and/or demolish/dismantle and remove all CONTRACTOR's site offices and quarters and other temporary works, constructions and erections whatsoever on or at the job site or on any land allotted to the CONTRACTOR by the OWNER and/or remove all rubbish from the job site, the land allotted to the CONTRACTOR and store, sell, dispose of and/or otherwise deal with any and all material, equipment and machinery etc., and other items and things aforesaid and recoveries of any demolition/dismantling as the OWNER shall in its absolute discretion deem fit, and the CONTRACTOR shall forthwith on demand pay the OWNER, the entirety of the costs and expanses of the OWNER relative to the above, together with 15% (fifteen percent) thereon to cover OWNER's supervision, with right in the OWNER (without prejudice to any other mode of recovery), to recover the same from the proceeds of any sale or disposal as aforesaid or any monies of the CONTRACTOR held by the OWNER or dues of the CONTRACTOR and the CONTRACTOR doth thereby irrevocably nominate, constitute and appoint the OWNER (with right to the OWNER to delegate any and all of its rights in terms hereof to such of its officer(s) and/or other person(s) as it shall deem fit) for and on behalf of and as attorney of the CONTRACTOR to do, commit and sign all acts, deeds, matters and things as shall or may be necessary to be done, committed and/or signed by the OWNER to put into effect the provision of this clause with full right to enter into arrangements with third parties for or relative to the storage, sales and/or other disposal of any material, equipment and machinery, etc., and other items and things and to enter into or upon any of the CONTRACTOR's premises and to break locks and other fasteners for entry thereto and generally to do all other acts, deeds, matters and things as shall be necessary to give full effect to the provision of this clause.

**PROVIDED ALWAYS THAT**

- (i) The OWNER shall be entitled, without prejudice to the foregoing and in addition thereto, upon the CONTRACTOR failing to comply with the provisions of Clause 7.0.5.0 hereof after removing/ demolishing/dismantling from the job site or land allotted to the CONTRACTOR, any of the CONTRACTOR's scaffolding, wiring, pipes, materials, temporary works and other items and things, by written notice to the CONTRACTOR, to require the CONTRACTOR to take delivery of, lift and/or clear the same within 7 (seven) days (or such other period as may be specified in the said notice) of date of said notice, failing which the OWNER may abandon the same at the risk and costs of the CONTRACTOR, and should the CONTRACTOR fail to take delivery of, lift and/or clear the same within the period in this behalf specified in said notice, the OWNER shall be entitled at any time thereafter to abandon the same at the risks and cost of the CONTRACTOR, whereupon (without

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prejudice to any other rights of the OWNER), the OWNER shall stand absolutely discharged and absolved in respect of all and any material, equipment, machinery and other items and things whatsoever abandoned as aforesaid;

- (ii) Notwithstanding anything to the contrary herein provided nothing herein stated shall constitute the OWNER as a trustee or bailee for or in respect of any of the CONTRACTOR's material, equipment, machinery or other items or things removed, cleared, demolished, dismantled or abandoned as aforesaid, nor shall the OWNER be bound in law or act by any duty of care in respect thereof, with the intent that all actions, dealings and disposals within the provisions of this clause shall be exclusively at the risks and liability of the CONTRACTOR (including relative to any loss or damage), and the OWNER shall not be howsoever responsible, accountable or liable in respect thereof.

**7.0.7.0** If, due to any cause (including, but not limited to resistance put up by the CONTRACTOR and/or his servants or agent or sub-CONTRACTOR(s) or any court order consequent upon a suit or proceedings filed by the CONTRACTOR and on the CONTRACTOR's servants,

agents or sub-CONTRACTOR(s), the OWNER is unable to fully take over possession of the entire works at any or all job sites within 7 (seven) days from the date of completion of the measurements as contemplated above, the OWNER shall, in addition to all amounts, compensation and/or damages recoverable from the CONTRACTOR in terms hereof (including but not limited to OWNER's entitlements under Clause 4.4.0.0 and Clause 7.0.9.0 hereof) or otherwise, be entitled to recover from the CONTRACTOR liquidated damages in the amount equivalent to 1% (one per cent) of the total Contract value for each week or part thereof that the said taking over of possession at any job site is delayed beyond the period of seven days specified above, subject to a maximum of 5% (Five percent) of the Total Contract Value.

**7.0.8.0** Notwithstanding anything provided in Clause 7.0.6.0, the OWNER shall have the right at any time prior to the removal of the same from the job site, to take possession of such of the CONTRACTOR's materials at any and all job sites, as the OWNER shall deem fit, and the CONTRACTOR shall forthwith upon being required to do so place the OWNER in undisputed possession and custody of all such materials opted for by the OWNER. The price payable to the CONTRACTOR for such material shall be determined by the Engineer-in-Charge having due regard to the condition of the materials and the cost thereof as determined by the Engineer-in-Charge for which purpose the Engineer-in-Charge shall be entitled to call upon the CONTRACTOR to produce the CONTRACTOR's accounting and other records relevant to such materials. The cost of such materials as determined by the Engineer-in-Charge shall be final and binding on the CONTRACTOR.

**7.0.9.0** Upon termination of the Contract, the OWNER shall be entitled at the risk and expense of the CONTRACTOR by itself or through any independent CONTRACTOR(s) or partly by itself and/or partly through independent CONTRACTOR(s) to complete and/or get completed to its entirety the work as contemplated in the scope of work and to recover from the CONTRACTOR in addition to any discounts, compensations or damages that the OWNER may in terms hereof or otherwise be entitled (including price discount within the provisions of Clause 4.4.0.0 and liquidated damages under





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Clause 7.0.7.0 hereof) to the difference between the amounts as would have been payable to the CONTRACTOR in respect of the work(s) (calculated as provided for in Clause 6.2.1.0 hereof read with the associated provisions thereunder and Clause 6.3.1.0 hereof) and the amount actually expended by the OWNER for completion of the entire work(s) as aforesaid together with 15% (fifteen per cent) of the said amount expended by the OWNER for completion of the entire work(s) to cover OWNER's supervision charges, and in the event of the latter being in the excess of the former, the OWNER shall be entitled (without prejudice to any other mode of recovery available to the OWNER) to recover the excess from the Security Deposit or any monies due or becoming due to the CONTRACTOR.

- 7.1.0.0 No amount shall be due and payable to the CONTRACTOR upon or in the event of termination of the Contract unless and until the entirety of the works contemplated in the scope of work shall have been completed in all respects to the satisfaction of the OWNER and following such completion, the Defect Liability Period in respect thereof as herein otherwise provided for has elapsed and all payments finally due on any account to the OWNER and/or other CONTRACTOR(s) in respect of all liabilities in respect thereof has been determined.
- 7.2.0.0 If, upon the satisfaction of the provisions of Clauses 7.0.9.0 and 7.1.0.0 hereof, there shall remain in the hands of the OWNER any excess/balance after all accounting and adjustment of all dues from the CONTRACTOR to the OWNER, the OWNER shall forthwith pay such excess/balance to the CONTRACTOR and in the event of the Security Deposit and other dues of the CONTRACTOR in the hands of the OWNER being insufficient to meet the dues

of the OWNER as aforesaid the CONTRACTOR shall forthwith on demand by the OWNER, pay the OWNER the shortfall.

**SECTION - 8**

**MISCELLANEOUS**

**8.0.0.0 PERSONAL ACTS AND LIABILITIES:**

- 8.0.1.0 No Director, officer or other employee of the OWNER shall anyway be personally bound or liable to the CONTRACTOR for the acts, omissions or obligations of the OWNER under the Contract otherwise or be personally answerable to the CONTRACTOR for or in respect of any default or omission in the performance of any act(s), deed(s), matter(s) or things to be observed and/or performed by the OWNER under the Contract.
- 8.0.2.0 The CONTRACTOR shall not be entitled to any increase in the rate(s) mentioned in the Schedule of Rates or any of them or to any other payment, right, benefit or claim whatsoever, by reason of any representation, explanation, statement, assurance or understanding given or alleged to have been given to him by any Director, officer, or other employees of the OWNER, nor shall any Director, officer, or other employee of the OWNER be personally liable for or in respect of any representation, explanation, statement, assurance or understanding given or alleged to have been



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given by him to the CONTRACTOR or any other person relative to the Contract.

8.0.3.0 The CONTRACTOR shall not under any circumstances pay or advance to any officer(s), servant(s) or agent(s) of the OWNER any sum of money on any account without prior authority of the OWNER in writing and any such payment made or money advanced by the CONTRACTOR without such authority shall be entirely at the risks of the CONTRACTOR without any liability to the OWNER in respect thereof.

8.0.4.0 Any money paid to any partner of the CONTRACTOR (if a firm) and any receipt, settlement, acknowledgement of liability or other document whatsoever signed by any one of the partners of the firm or erstwhile partner of the firm (without notice of the cessation of his interest) or any person held out to be a partner of the firm shall be binding upon the CONTRACTOR vis-à-vis the OWNER and shall constitute a full release and discharge to the OWNER and/or valid settlement, acknowledgement or obligation upon the CONTRACTOR, as the case may be, and the OWNER shall not be concerned, with the application of any monies so paid or the authority of the concerned partner (or erstwhile or purported partner) vis-à-vis the other partners to make the settlement, receipt, acknowledgement or other documents(s) concerned provided always that the OWNER shall be entitled at its discretion at any time to call upon all the partners of the CONTRACTOR firm to sign any receipt, settlement, acknowledgement or other document(s) including any receipt, settlement, acknowledgement or other documents signed by a partner (or erstwhile or purported partner) as aforesaid, and all the partners of the firm shall, when called upon to do so by the OWNER, forthwith sign the receipt, order, acknowledgement or other document required to be so signed.

#### 8.1.0.0 TAXES

8.1.1.0 The CONTRACTOR shall be exclusively liable for the payment of any and all taxes now in force or hereafter imposed, increased or modified in respect of any work done and/or

materials supplied and for the payment of all contributions and taxes for unemployment compensation, insurance and old age pension and annuity now or hereinafter imposed by the Central or any State Government or any authority with respect to or covered by the wages, salaries or other compensations paid to persons employed or engaged by the CONTRACTOR and doth hereby undertake to Indemnify and keep indemnified the OWNER from and against the same and all claims, actions, demands and payments whatsoever against the OWNER howsoever arising there from or in connection therewith.

#### 8.2.0.0 GOVERNMENT REGULATIONS:

8.2.1.0 The CONTRACTOR shall comply with and ensure strict compliance by his/its sub-contractors and agents of all applicable Central, State, Municipal and local laws and regulations and undertakes to indemnify the OWNER from and against all levies, damages, penalties, any payments whatsoever as may be imposed by reason of any breach or violation of any law, rule or regulation and against all actions, proceedings claims and demands arising there from and/or relative thereto.

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### 8.3.0.0 LABOUR LAWS AND REGULATIONS

8.3.1.0 The CONTRACTOR shall be responsible for strict compliance of and shall ensure strict compliance by its sub-contractors, servants and agents of all laws, rules or regulations having the force of law affecting the relationship of employer and employee between the CONTRACTOR/sub-contractors and their respective employees and/or otherwise concerning labour, social welfare and provident fund, pension, bonus, gratuity and other benefits to employees. Without prejudice to the generality of this provision, the CONTRACTOR shall comply with and ensure that his sub-contractors and other agencies employed by him comply with the provisions of the Payment of Wages Act 1936, Minimum Wages Act 1948, Employers Liability Act 1938, Workman's Compensation Act 1923, Industrial Disputes Act 1947, Employers Maternity Benefit Act 1961, Mines Act 1952, Contract Labour (Abolition & Regulation) Act 1970, Payment of Bonus Act, Gratuity Act, Factories Act and the Employees Provident Fund and Miscellaneous Provisions Act 1952 as amended from time to time and all rules, regulations and schemes framed thereunder from time to time.

8.3.2.0 The contractor and sub-contractor(s) of the CONTRACTOR shall obtain from the authority(ies) designated in this behalf under any applicable law, rule or regulation (including but not limited to) the factories Act and Labour (Abolition and Regulation) Act, 1970 (in so far as applicable) any and all such license(s), consent(s), registration(s) and/or other authorization(s) as shall from time to time be or become necessary for or relative to the execution of the work or any part or portion thereof or the storage or supply of any material(s) or otherwise in connection with the performance of the Contract and shall at all times observe and ensure due observance by the sub-contractors, servants and agents of all terms and conditions of the said license(s), consent(s), regulation(s) and other authorization(s) and laws, rule and regulations applicable thereto. Without prejudice to the generality of this provision, the CONTRACTOR shall obtain and ensure that the sub-contractors and other agencies employed by him on the Work, obtain a valid License under the Contract Labour (Regulation & Abolition) Act, 1970 and shall duly and faithfully observe and comply with the provisions of the Contract Labour (Regulation & Abolition) Central Rules 1971 and other Central and State Rules as amended from time to time and applicable to the work, and shall duly, promptly and faithfully maintain and/or cause to be maintained all records and facilities required to be maintained and/or provided in terms thereof of any licence granted thereunder.



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- 8.3.3.0 The CONTRACTOR shall ensure that wages are paid by himself or by his sub-contractors to their workmen directly without the intervention of any Jamadars or Thekedars and that no amount by way of commission or otherwise is deducted or recovered by the Jamadars from the wages of the workmen.
- 8.3.4.0 The OWNER shall be entitled at all times to carry out any check(s) or inspection(s) of the CONTRACTOR's facilities, records and accounts to ensure that the provisions aforesaid are being observed by the CONTRACTOR and the sub-contractors and that the workmen are not denied the rights and benefits to which they are entitled under such provisions. Any violation shall, without prejudice to any other rights or remedies available to the OWNER, constitute a ground for termination of the Contract as though specifically set forth under Clause 7.0.1.0 thereof.
- 8.3.5.0 Nothing in the Contract Documents stated shall anyway constitute any workman/employee of the CONTRACTOR or any sub-contractor as or to be a workman/employee of the OWNER, or place obligation or liability in respect of any such workman/employee upon the OWNER.
- 8.3.6.0 The CONTRACTOR shall not employ in connection with the work, any person below the age of 18 years.
- 8.3.7.0 The establishment of the CONTRACTOR shall be duly registered under the Employees Provident Fund and Miscellaneous Provisions Act, 1952 and the Employees State Insurance Act, 1948 and the CONTRACTOR shall duly pay his contributions and his employees contributions to the Authorities prescribed under the said Acts and any Schemes framed thereunder in respect of all labour employed by him for the execution of the contract.
- 8.3.8.0 On receiving information of any breach, non-fulfillment and/or non-observance by the CONTRACTOR and/or his sub-contractors and other agencies engaged by him in connection with the Works or any of the provisions or requirements of any of the Labour Laws, rules and regulations and/or as to the inaccuracy of any of the returns or statements furnished by the CONTRACTOR and/or his sub-contractors and/or any records or accounts maintained by any of them with respect to which the OWNER as the principal employer or otherwise can have a liability, the OWNER shall be entitled to deduct from the Bills and any amounts due and becoming due to the CONTRACTOR, under this or other contract(s) with the CONTRACTOR, any sum(s) required or estimated to be required, in its judgement which shall be final and binding on the CONTRACTOR, for making good or compensating for the liability or possible liability of the OWNER by reason of the said breach, non-fulfillment or non-observance and/or inaccuracy aforesaid.
- 8.3.9.0 The CONTRACTOR shall indemnify and keep indemnified the OWNER from and against all actions, claims, demands and liabilities whatsoever under and in respect of the breach of any of the provisions hereof and/or against any claim, action or demand by any workman/employee of the CONTRACTOR or any sub-contractor and/or from any liability anyway to any sub-contractor under any law, rules or regulation having the force of law including (but not limited to) claims against the OWNER under the Workmen's Compensation Act 1923, The Employees Provident Funds and

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Miscellaneous Provisions Act, 1952, the Employee's State Insurance Act, 1948 and/or the Contract Labour (Abolition & Regulation ) Act, 1970.

- 8.3.10.0 The CONTRACTOR and his sub-contractors and agents employed by him for and/or in the performance of the Works shall strictly abide by and observe the provisions of the "Contractors' Labour Regulations" and the "Model Rules for Labour Welfare" as set out in Appendix I and Appendix II to these General Conditions of Contract, which shall be binding on the CONTRACTOR, his sub-contractors and agents.
- 8.3.10.1 In the event of an irreconcilable conflict between the provisions herein and the provisions contained in the "Contractors' Labour Regulations" and/or the "Model Rules of Labour Welfare" (as set out in Appendix I and Appendix II hereto) the "Contractors' Labour regulations" and " Model Rules for Labour Welfare" shall prevail to the extent of the irreconcilable conflict.
- 8.3.10.2 In the event of irreconcilable conflict between the "Contractors' Labour Regulations" and/or the "Model Rules for Labour Welfare" (set out in Appendix I and Appendix II hereto) and any applicable law, rule or regulation, the law, rule or regulation shall prevail over the "Contractors' Labour Regulation" and/or the "Model Rules for Labour Welfare", as the case may be, and shall be complied with.
- 8.4.0.0 SAFETY REGULATIONS, ACCIDENT AND DAMAGE**
- 8.4.1.0 The CONTRACTOR shall be responsible at his own cost in and relative to performance of the work and contract to observe and to ensure observance by his sub-contractors, agents and servants of the provisions of the Safety Code as hereinafter appearing and all fire, safety and security regulations as may be prescribed by the OWNER from time to time and such other precautions and measures as shall be necessary and shall employ/deploy all equipments necessary to protect all works, material properties, structures, equipment, installations, communications and facilities whatsoever from damage, loss or other hazard whatsoever (including but not limited to fire and explosion) and shall during construction and other operations minimize the disturbance and inconvenience to the OWNER, other contractors, the public and the adjoining land and property owners and occupiers and crops, trees and vegetation and shall indemnify and keep indemnified the OWNER from and against all losses and damages and costs, charges and expenses and penalties, actions, claims, demands and proceeding whatsoever suffered or incurred by or against the OWNER as the case may be, by virtue of any loss, alteration, displacement, disturbance or destruction or accident to any works, materials, properties, structures, equipment, installations, communications and facilities and land and property, owner and occupiers and crops, trees, and vegetation as aforesaid, with the intent that the CONTRACTOR shall be exclusively responsible for any accident, loss, damage, alteration, displacement, disturbance or destruction as aforesaid resultant directly or indirectly from any breach by the CONTRACTOR of his obligations aforesaid or upon any operation, act or omission of the CONTRACTOR or his sub-contractor(s) or agent(s) or servant(s).
- 8.4.2.0 The CONTRACTOR's liabilities under Clause 8.4.1.0 and otherwise under the Contract

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shall remain unimpaired notwithstanding the existence of any storage-cum-erection or other insurance covering any risk, damage, loss or liability for which the CONTRACTOR is liable to the OWNER in terms of the foregoing sub-clause or otherwise and/or in respect of which the CONTRACTOR has indemnified the OWNER, with the intent that notwithstanding the existence of such insurance, the CONTRACTOR shall be and remain fully liable for all liabilities and obligations under the Contract and indemnities to the OWNER, and the OWNER shall not be obliged to seek recourse under such policy(ies) in preference to recourse against the CONTRACTOR or otherwise to exhaust any other remedy in preference to the remedies available to it under the Contract.

#### **8.5.0.0 INDEMNITY AND INSURANCE:**

8.5.1.0 The CONTRACTOR shall at all times indemnify and keep indemnified the OWNER and its officers, servants and agents from and against all third party claims whatsoever (including but not limited to property loss and damage, personal accident, injury or death of or to property or

person of any sub-contractor and/or the servants or agents of the CONTRACTOR or any other contractor(s) and any sub-contractor and/or of the OWNER), and the CONTRACTOR shall at his own cost and initiative at all times up to the successful conclusion of the defect liability period specified in Clause 5.4.1.0 hereof take out and maintain insurance policies in respect of all insurable liabilities under this clause, including but not limited to third party insurance and liabilities under the Motor Vehicles Act, 1988; Workmen's Compensation Act, 1923; Fatal Accidents Act, 1855; Personal Injuries (Compensation) Insurance Act, 1963, Emergency Risk Insurance Act, and/or other Industrial Legislation from time to time in force in India with insurance Company(ies) approved by the OWNER, and such policy(ies) shall be of not lesser limit than the limits hereunder specified with reference to the matters hereunder specified namely :

- (a) Workmen's Compensation Insurance - to the limit to which compensation may be payable under the laws of the Republic of India; but not less than the limits specified below.
- (b) Third Party Insurance - body injury and property damage to the limit specified below The limits aforesaid shall be as follows :
  - (i) If the total contract value exceeds Rs. 1 (one) crore, the policy shall be for not less than Rs. 10,00,000/- (Rupees ten lakhs only) for each accident. The sum assured shall not be less than Rs. 20,00,000/- (Rupees twenty lakhs only) for all accidents; and
  - (ii) If the total contract value does not exceed Rs. 1 (one) crore, the policy shall be for not less than Rs. 3,00,000/- (Rupees three lac only) for each accident. The sum assured shall not be less than Rs. 10,00,000/- (Rupees ten lakhs only) for all accidents.

Provided that the limits specified above shall operate only as a specification of minimum limits for insurance purpose, but shall not anyway limit the Contractor's liability in terms of this clause to the limit(s) specified.



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8.5.1.0 Should the CONTRACTOR fail to take out and/or keep afoot insurance as provided for in the foregoing sub-clauses, the OWNER shall be entitled (but without obligation to do so) to take out and/or keep afoot such insurance at the cost and expense of the CONTRACTOR and without prejudice to any other right or remedy of the OWNER in this behalf to deduct the sum(s) incurred therefore from the dues of the CONTRACTOR.

#### 8.6.0.0 TRAINING OF APPRENTICES:

8.6.1.0 The CONTRACTOR shall, if and when called upon the Engineer-in-Charge during the currency of Contract himself engage and/or procure engagement by his sub-contractor(s) of such number of apprentices and for such period as may be required by the Engineer-in-Charge in this behalf. Such apprentices shall be trained in accordance with the provisions of the Apprentices Act, 1961 and any other Act, rule or regulation having the force of law, regulating upon the employment of apprentices, and the CONTRACTOR shall be responsible at his own cost and initiative and without entitlement to any extra compensation or remuneration from the OWNER in this behalf, to fulfill all obligations of the employer under the said Act, including liability for payment to apprentices as required thereunder.

#### 8.7.0.0 RECORDS AND INSPECTION

8.7.1.0 The CONTRACTOR shall, if and when required by the Engineer-in-Charge produce or cause to be produced before the Engineer-in-Charge or any other officer of the OWNER designated

by the Engineer-in-Charge in this behalf, for examination, any cost or other book(s) of account and/or other records and documents in the possession of the CONTRACTOR or any sub-contractor or subsidiary or associated firm or company of the CONTRACTOR or any sub-contractor, and/or copies of extracts thereof and/or other information or returns relative thereto (such returns to be verified in the manner prescribed by the Engineer-in-Charge or other officer aforesaid designated in this behalf) as may be required relative to the execution of the Contract or for verifying or ascertaining the cost of any material, labour, service or item or thing whatsoever in connection with the Contract, and the decision of the Engineer-in-Charge or other officer designated in this behalf, as the case may be, as to whether any book, record, document, information or return is relevant for any of the purpose aforesaid, shall be final and conclusive.

8.7.2.0 Should the Engineer-in-Charge (whose decision in this behalf shall be final) consider it necessary for the purpose of verifying or ascertaining the cost of production for any item or thing to examining the works and/or records of the CONTRACTOR or any sub-contractor(s) or any subsidiary or associated firm or company of the CONTRACTOR engaged in the fabrication, manufacture or assembly of any item or thing, the CONTRACTOR shall permit and/or facilitate such inspection by the Engineer-in-Charge or other officer of the OWNER designated in this behalf by the Engineer-in-Charge and shall afford the Engineer-in-Charge or concerned officer all assistance as shall be necessary for the purpose.

#### 8.8.0.0 PATENT AND ROYALTIES:



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8.8.1.0 If any equipment, machinery or materials to be used or supplied or methods or processes to be practiced or employed in the performance of this Contract is/are covered by a patent under which the CONTRACTOR is not licensed, the CONTRACTOR shall before supplying or using the equipment, machinery, materials, methods or processes as the case may be, obtain such licence(s) and pay such royalty(ies) and licence fee(s) as may be necessary in connection with the performance of this Contract. In the event that the CONTRACTOR fails to pay such royalty or obtain such licence, the CONTRACTOR will defend at his own expense any suit for infringement of patent which is brought against the CONTRACTOR or the OWNER as a result of the failure, and shall pay any damages and costs awarded in such suit and will keep the OWNER indemnified from and against all other consequences thereof.

#### 8.9.0.0 ARTICLES OF VALUE FOUND:

8.9.1.0 All gold, silver and other metals, minerals or ore of any kind or description and precious and semi-precious stones and bearing earth, rock or strata, coins, treasures, treasure trove, antiques and other items and things whatsoever which shall be found under or upon the job site shall as between the CONTRACTOR and the OWNER be the exclusive property of the OWNER and the CONTRACTOR shall forthwith upon discovery thereof notify the OWNER of such discovery with the details of the item(s) or thing discovered and pending directions by the OWNER for the disposal thereof shall hold and preserve the same as trustee of the OWNER to the satisfaction of the Engineer-in-Charge.

#### 8.10.0.0 MATERIALS OBTAINED FROM DISMANTLING:

8.10.1.0 Any material obtained by the CONTRACTOR consequent upon dismantling of any building, structure or construction whatsoever at the job site other than any building, structure of construction dismantled by the CONTRACTOR pursuant to the CONTRACTOR's liabilities for defects as elsewhere herein provided, shall be the exclusive property of the OWNER.

#### 8.11.0.0 LIENS AND LIABILITIES:

8.11.1.0 If at any time there is evidence of any lien or claim for which the OWNER might be or become liable and which in terms of the Contract or otherwise is chargeable to or payable by the

CONTRACTOR, the OWNER shall have the right to retain out of any payment then due or thereafter becoming due to the CONTRACTOR an amount sufficient to completely indemnify the OWNER against such lien or claim, and should the CONTRACTOR not dispute such lien or claim and/or if in the opinion of the OWNER, such lien or claim is otherwise valid (the Owner's opinion in this behalf being final and binding on the CONTRACTOR), the OWNER may pay and discharge the same and deduct the amount so paid together with any legal and other costs, charges and expenses incurred by the OWNER in defending any action and/or in obtaining legal advice or opinion relative to the lien, claim or action, from any monies then due or thereafter becoming due to the CONTRACTOR and/or retained as aforesaid, and if there is no money due or retained as aforesaid or if the same be insufficient to satisfy the payment(s) aforesaid, the CONTRACTOR shall on demand pay to the OWNER the same and failing such payment within 10 (ten) days of demand by the OWNER in this behalf, shall be liable

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to pay interest on the amount due from the date of demand up to and until the date of payment in full at the bank rate as applicable to the OWNER plus 1% (one percent) per annum and the provisions hereof (in so far as such notice shall be deemed to be necessary in addition to the contractual provisions herein) shall be deemed to constitute a notice for the payment of interest under the provisions of the Indian Interest Act and in determining such interest, the Certificate issued by an officer of the OWNER in a financial department of the OWNER shall be conclusive evidence of the Bank rate of interest applicable to the OWNER.

#### **8.12.0.0 LIABILITIES FOR SUB-CONTRACTOR(S):**

8.12.1.0 Without prejudice to any other liabilities or obligations of the CONTRACTOR relative to sub- contractors in terms hereof or otherwise, the CONTRACTOR shall require every sub- contractor to whom any portion of the work to be performed under the Contract has been sub- contracted, to comply with the provisions of the Contract in so far as applicable to each sub- contractor, and the CONTRACTOR shall hold the OWNER harmless and indemnified from any and against all penalties, actions, claims and demands and costs, charges and expenses whatsoever arising out of or in connection with any failure of the CONTRACTOR or any sub- contractor(s) to make full and proper compliance with any of the terms and conditions of the Contract.

#### **8.13.0.0 WAIVER**

8.13.1.0 It shall always be open to the OWNER by written communication to the CONTRACTOR to waive in whole or part any right or the enforcement of any right or remedy which the OWNER may have against the CONTRACTOR or of any obligations which the CONTRACTOR may have hereunder, provided always that:

- (i) No waiver shall be presumed or inferred unless made in a written communication addressed by the OWNER to the CONTRACTOR and specifically communicated as a Waiver;
- (ii) No waiver of any right or part of any right on one occasion shall be deemed to be a waiver or abandonment of that right for all occasions with the intent that a waiver once given shall be limited to the specific waiver and shall be without prejudice to the right of the Owner to insist upon the strict adherence of the attendant obligations of the Contractor and /or the future enforcement of the right by the Owner in respect of the same and/or any other dependent obligation.

#### **8.14.0.0 CONTRACTOR'S ESTABLISHMENT**

8.14.1.0 It is understood that the establishment of the CONTRACTOR (and any Sub-Contractor engaged by the CONTRACTOR) constitutes an independent establishment involving inter alia in undertaking works and/or services for others of the nature and kind forming the subject

matter of the contract. It is consequently understood that all the employees of the CONTRACTOR (and any Sub-Contractor engaged by the CONTRACTOR) are the employees of the independent establishment of the CONTRACTOR or Sub-Contractor (as the case may be) who have been and will be appointed solely for and/or with reference to the work of that establishment, and have not been and will not be appointed specifically or otherwise for the sole purpose of the work covered by the present Contract. To this end, each CONTRACTOR (and Sub-Contractor engaged by

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the CONTRACTOR) shall issue to each of its employees deputed to the job-site to perform any work in relation to the Contract a regular letter of appointment for employment in the CONTRACTOR's/ Sub- Contractor's independent establishment, with authority in the CONTRACTOR/Sub-Contractor to employ or depute him for or in relation to any work or engagement assumed by the CONTRACTOR/Sub-Contractor from time to time in the course of its business and the production of a certified copy of each letter of appointment duly acknowledged by the concerned employee shall be a pre-condition for the issue of a Gate Pass to any employee of the CONTRACTOR/Sub-Contractor into any area the entry to which is restricted by the OWNER.

#### **8.15.0.0 COLLECTION OF INDEBTEDNESS**

8.15.1.0 Without prejudice to any other rights or remedies of the OWNER and in addition to any other provisions hereof, the OWNER shall be entitled to deduct out of the Security deposit (including by recourse Bank Guarantee) any monies or securities under this or any other contract(s) for the time being to the CONTRACTOR in its hands and out of any payments then due or becoming due in future for the CONTRACTOR under this or any other Contract, any and all amounts due to the OWNER from the CONTRACTOR arising out of or in connection with the Contract.



#### **8.16.0.0 OBSERVANCE OF ENVIRONMENTAL REGULATIONS AND ENVIRONMENTAL PROTECTION.**

8.16.1.0 The CONTRACTOR shall ensure that its servants and agents and sub-contractors and their servants and agents shall duly comply with all environmental laws, rules and regulations and the conditions of any permit, permission, consent and/or no-objection granted in this behalf by any authority with respect to or concerning the work, and shall independently so organize and conduct its operations and cause its sub-contractors to so organize and conduct their operations as not to cause any hazard or pollution to health, life, property or environment including (but not limited to) discharge of any noxious substance or effluent into the atmosphere or into the earth or into any drain, canal, stream, river, pond, lake or other water body.

8.16.2.0 The CONTRACTOR shall indemnify and keep indemnified the OWNER from and against the breach, non-observance, infraction or dereliction of any of the provisions of Clause 8.16.1.0 hereof, and against any and all claims, actions or proceedings, prosecutions, litigations and losses and damages and costs (including legal costs), charges and expenses whatsoever suffered or incurred or instituted against the OWNER as the case may be.

#### **8.17.0.0 CONFIDENTIAL HANDLING OF INFORMATION**

8.17.1.0 The CONTRACTOR and its/his employees, agents and Sub-Contractors and the employees and agents of the Sub-Contractor(s) shall treat as strictly confidential and shall take all steps necessary to ensure confidential handling of all maps, plans, charts, designs, drawings, photographs, data, reports, tests, specifications, methods, and other information developed or acquired by the CONTRACTOR from or by means of the Tender Documents or any facility extended to the CONTRACTOR pursuant thereto or the award or performance of the works or any of them or otherwise disclosed or made available to the CONTRACTOR or any of the

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aforesaid persons, and shall not disclosed or reproduce the same in any book, article, speech or other publication, provided always that the OWNER may upon application by the CONTRACTOR to the OWNER in this behalf permit report, disclosure or reproduction of the same in any book , article speech or other publication if it is satisfied that this would not involve the disclosure of any classified or other information which would not be in the interest of public or security to disclose.

- 8.17.2.0 Application for such consent shall be submitted to the OWNER in writing outlining the intended use of the relative material and shall be submitted to the OWNER at least one month prior to the expected use accompanied by the text of the relative publication in which it is sought to be used. Photographs should be accompanied by their caption. An application shall not be understood to have been permitted unless expressly permitted in writing by the OWNER.

## SECTION -9

### ARBITRATION & CONCILIATION



**9.0.0.0 ARBITRATION& CONCILIATION: Applicable for all the Tenders valuing above Rs.5 Lakhs:**

Parties hereby agree as under:

If any difference or dispute (hereinafter referred as “Dispute”) under the Contract arises, the party shall give a 60 days written notice (“Dispute Notice”) to the identified officer of the other party mentioned in the Contract giving details of the Dispute. The Parties shall use all reasonable endeavours to resolve the Dispute mutually and amicably. All efforts by either party within these 60 days Dispute Notice Period shall be kept confidential by both the parties under Section 75 of the Arbitration and Conciliation Act, 1996. Parties shall not rely upon any views expressed or suggestions made by the other party, admissions made by the other party or the fact that the other party had indicated his willingness to enter into a settlement as evidence in any Forum / arbitration / court proceeding.

If Parties are unable to resolve the Dispute amicably within 60 days of receipt of the Dispute Notice, then after expiry of the 60 days’ Dispute notice period, the aggrieved Party can refer the Dispute to conciliation and / or arbitration subject to terms and conditions contained herein below:

- 1) Parties further agree that following matters shall not be referred to Conciliation or Arbitration:
  - i) Any claim, difference or dispute relating to, connected with or arising out of MRPL decision to initiate any proceedings for suspension or banning, or decision to suspend or to ban business dealings with the Bidder / Contractor and/or with any other person involved or connected or dealing with bid / contract / bidder / contractor.
  - ii) Any claim, difference or dispute relating to, connected with or arising out of MRPL decision under the provisions of Integrity Pact executed between MRPL and the Bidder / Contractor.

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- 2) Part-I: Conciliation (Not applicable in contracts valuing less than Rs. 10 lakhs)  
3) Part-II: Arbitration (Not applicable in contracts valuing less than Rs. 5 lakhs) If the parties are not able to resolve the dispute through OEC or do not opt for conciliation through OEC, the party may invoke arbitration clause as provided in the contract.

#### 9.0.1.0 **PART - I: CONCILIATION: Resolution of disputes through conciliation by OEC**

(Not applicable in Contracts valuing less than Rs.10 lakhs):

If any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the contract or breach thereof which parties are unable to settle mutually, the same may first be referred to conciliation through Outside Expert Committee (“OEC”) to be constituted by MD, MRPL as provided hereunder:

##### **Submission of proposal for OEC**

1. Conciliation through OEC will be resorted in all cases involving disputed amount up to ‘ 250 crores only. The disputed amount will be calculated by considering the amount of claim and counter-claim of the parties.
2. Claimant shall give a 30 days’ notice for conciliation. In cases where the contractor is claimant then the notice shall be given to the concerned MRPL office as per the contract, clearly bringing out the points of dispute and the amount claimed with documents in support of the claim and the party concerned shall not raise any new issue thereafter.

##### **Constitution of OEC**

3. MD, MRPL will have the sole discretion to constitute OEC. OEC will be formed from the panel of experts maintained by MRPL and will normally comprise of three members, one member from each category i.e., Technical, Finance, Commercial and Legal. However, there will be a single member OEC for disputes involving a claim and counter claim (if any) up to ‘ 1 crore.
4. MD, MRPL will have authority to reconstitute an OEC to fill any vacancy or if any OEC member is not available to attend the OEC Meetings.
5. Upon constitution of the OEC, Head-Legal will issue the appointment letters to OEC members and inform same to the parties concerned.
6. The OEC members shall give a declaration of independence and impartiality (in the format at **Annexure D**) to both the parties before the commencement of the OEC proceedings.

##### **Proceedings before OEC**

7. The claimant shall submit its statement of claims to OEC members, and to the party(s) prescribed in the appointment letter within 30 days of the issue of the appointment letter. The claims shall be raised as per the format at **Annexure E**.



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8. The respondent shall file its reply and counter claim (if any) within 30 days of the receipt of the statement of claims. (As per aforesaid format at **Annexure E**).
9. Parties may file their rejoinder/additional documents, if any in support of their claim/counter claim within next 15 days. No documents shall be allowed thereafter.
10. OEC will commence its meetings only after completion of the pleadings.
11. In case of 3 members OEC, 2 members will constitute a valid quorum and the meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary video conferencing may be arranged. However, OEC Recommendations will be signed by all Members. Further, efforts must be made for unanimous recommendations.
12. The parties shall be represented by their in-house employees/executives. No party shall be allowed to bring any advocate or outside consultant/advisor/agent to contest on their behalf. Ex-officers of MRPL who have handled the dispute matter in any capacity are not allowed to attend and present the case before OEC on behalf of Contractor. However, ex-employees of parties may represent their respective organizations.
13. Solicitation or any attempt to bring influence of any kind on either OEC Members or MRPL is completely prohibited in conciliation proceedings and MRPL reserves the absolute right to close the conciliation proceedings at its sole discretion if it apprehends any kind of such attempt made by the Contractor or its representatives.
14. Parties agree to rely only upon documentary evidence in support of their claims and not to bring any oral evidence in the OEC proceedings.
15. OEC will give full opportunity of hearing to the parties before giving its recommendations.
16. OEC will conclude its proceedings in maximum 10 meetings, and give its recommendations within 90 days of its first meeting. OEC will give its recommendations to both the parties recommending possible terms of settlement MD, MRPL may extend the time/ number of meetings, in exceptional cases, if OEC requests for the same with sufficient reasons.
17. OEC members will be paid fees (plus applicable tax) and provided facilities as detailed in clause 29 below, subject to revision by MRPL from time to time and subject to Government guidelines on austerity measures, if any. All the expenditure incurred in the OEC proceedings shall be shared by the parties in equal proportion. The parties shall maintain account of expenditure and present to the other for the purpose of sharing on conclusion of the OEC proceedings.
18. Depending upon the location of the OEC members and the parties, the venue of the OEC meeting shall be Delhi /Mangaluru / Bengaluru or any other location whichever is most economical from the point of view of travel and stay etc.
19. Parties shall not claim any interest on claims/counterclaims from the date of notice



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invoking conciliation till execution of settlement agreement, if so arrived at. In case, parties are unable to reach a settlement, no interest shall be claimed by either party for the period from the date of notice invoking conciliation till the date of OEC recommendations and 30 days thereafter in any further proceeding.

20. Legally, parties are under no obligation to refer a dispute to conciliation or continue with conciliation proceedings. Parties are free to terminate the conciliation proceedings at any stage as provided under the Arbitration and Conciliation Act, 1996 and subsequent amendments or re-enactment thereof.

#### **Actions after OEC Recommendations**



21. The recommendations of OEC are non-binding and the parties may decide to accept or not to accept the same. Parties are at liberty to accept the OEC recommendation with any modification they may deem fit.
22. The contractor shall give its response to MRPL within 7 days of receiving OEC Recommendation.
23. If the recommendations are acceptable to the contractor partly or fully, MRPL will consider and take a decision on OEC recommendations. MRPL shall communicate its decision to the contractor. If decision of MRPL is acceptable to the contractor, a settlement agreement under Section 73 of the Arbitration and Conciliation Act, 1996 will be signed within 15 days of contractor's acceptance and same shall be authenticated by all the OEC Members.
24. The timelines mentioned in the above guidelines are with an objective to achieve expeditious conclusion of OEC proceedings. However, it does not mean that any action beyond the timelines will be invalid. However, the party concerned will make all efforts to complete the actions within the stipulated time.
25. Parties shall keep confidential matters relating to the conciliation proceedings including minutes of OEC meeting and Recommendations of OEC. Parties shall not rely upon them as evidence in any Forum/arbitration/court proceeding, whether or not such proceedings relate to the dispute that is the subject of the conciliation proceedings,
- Views expressed or suggestions made by the other party in respect of a possible settlement of the dispute.
  - Admissions made by the other party in the course of the OEC proceedings;
  - Proposals made by the OEC;
  - The fact that the other party had indicated his willingness to accept a proposal for settlement made by the OEC.
26. Confidentiality extends also to the settlement agreement, except where its disclosure is necessary for purposes of implementation and enforcement. This stipulation will not apply to disclosure made by MRPL to Govt. of India, if required.


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27. Subject to terms and conditions contained in the above paras, the provisions of the Part III of Arbitration and Conciliation Act, 1996 shall be acceptable to the conciliation proceedings and the parties and the OEC members shall be bound by the same.
28. If the parties are not able to resolve the dispute through OEC or do not opt for conciliation through OEC, the party may invoke arbitration clause as provided in the contract.
29. **Fees and Facility to the OEC Members :**

OEC members shall be entitled for the following fees plus applicable taxes per member and facilities:

Sl. No	Fees/Facility	Entitlement	To be paid by
1	Fees	Rs 20,000/- per meeting subject to maximum of Rs. 2,00,000/-* for the whole case. In addition, one OEC member chosen by OEC shall be paid an additional amount of Rs 10,000/- towards secretarial expenses in writing minutes/ OEC Recommendations.	Contractor
2.	Fee for attending meeting/s to authenticate the settlement agreement.	Rs 10,000/-	Contractor
3.	Transportation in the city of meeting	Car as per entitlement or Rs 2,000/- per day	Contractor
4.	Venue of the meeting	MRPL conference rooms/Hotels	MRPL
<b>Facilities to be provided to the out-stationed member</b>			
5.	Travel from the city of residence to the city of meeting	Business class air tickets/first class train tickets/ car/ reimbursement of actual fare. However, entitlement of air travel by Business class shall be subject to austerity measures, if any, ordered by Govt. of India.	Contractor

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6.	Transport to and fro airport / railway station in the city of residence	Car as per entitlement or Rs3,000/-	Contractor
7.	Stay for out stationed members	5 Star Hotel	MRPL
8.	Transport in the city of meeting	Car as per entitlement or Rs 2,000/- per day	Contractor

\* except in exceptional cases, where the no. of meetings may extend beyond 10.

9.0.2.0 **PART - II: ARBITRATION**(Applicable in case of supply orders/Contracts with firms, other than Public Sector Enterprises) (Not applicable in contracts valuing less than ₹ 5 lakhs)

Except as otherwise provided elsewhere in the contract, if any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the contract or breach thereof which parties are unable to settle mutually or through conciliation, the same shall be referred to Arbitration as provided hereunder:

1. There shall be no arbitration for disputes involving claims up to ₹ 25 lakhs and more than ₹ 100 crores. The disputed amount will be calculated by considering the amount of claim and counter-claim of the parties. Unresolved disputes involving claims above ₹ 100 crores shall be adjudicated under the Commercial Courts, Commercial Division and Commercial Appellate Division of High Courts Act, 2015.
2. A party wishing to commence arbitration proceeding shall invoke Arbitration Clause by giving 60 days' notice to the other party. The notice invoking arbitration shall specify all the points of disputes with details of the amount claimed to be referred to arbitration at the time of



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invocation of arbitration and not thereafter. If the claim is in foreign currency, the claimant shall indicate its value in Indian Rupee for the purpose of constitution of the arbitral tribunal.

3. Arbitration can be invoked by giving Invocation Notice only after expiry of the 60 days' period as per Dispute Notice.
4. For a dispute involving claims above ` 25 lacs and upto ` 5 crores, in case other party is Claimant, MRPL will forward a list containing names of five jurists to the other party for selecting one from the list who will be appointed as sole arbitrator by MRPL. In case MRPL itself is the Claimant, it shall appoint the Sole Arbitrator by invoking the Arbitration clause and inform the Contractor. Such dispute shall be resolved on fast track procedure specified in Section 29B of the Arbitration and Conciliation Act, 1996.
5. For a dispute involving claims above ` 5 crores and upto ` 100 crore, the claimant shall appoint an Arbitrator and communicate the same to the other Party in the Invocation Notice itself along with the copy of disclosure made by nominated Arbitrator in the form specified in Sixth Schedule of the Arbitration & Conciliation Act, 1996. For the purpose of Section 21, the Arbitration Proceeding shall commence only upon date of receipt of Invocation Notice complete in all respects mentioned above. The other Party shall then appoint the second Arbitrator within 15 days from the date of receipt of written notice. The two Arbitrators appointed by the Parties shall appoint the third Arbitrator, within 30 days, who shall be the Presiding Arbitrator. The parties agree that they shall appoint only those persons as arbitrators who accept the conditions of this arbitration clause. No person shall be appointed as arbitrator or presiding arbitrator who does not accept the conditions of this arbitration clause.
6. For the purpose of appointment of Arbitrator(s), claims amount shall be computed excluding claim for interest, if any.
7. The parties agree that they shall appoint only those persons as arbitrators who accept the conditions of this arbitration clause. No person shall be appointed as arbitrator or presiding arbitrator who does not accept the conditions of this arbitration clause.
8. Parties agree that there will be no objection if the Arbitrator appointed holds equity shares of MRPL and/or is a retired officer of MRPL / any PSU. However, neither party shall appoint its serving employee as arbitrator and shall have been retired before 3 years on the date of commencement of the Arbitration.
9. If any of the Arbitrators so appointed dies, resigns, becomes incapacitated or withdraws for any reason from the proceedings, it shall be lawful for the concerned party/arbitrators to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left if both parties consent for the same; otherwise, he shall proceed de novo.

10. Parties agree that neither party shall be entitled for any pre-reference or pendent-

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lite interest on its claims, i.e. date of cause of action till date of Award by Arbitral Tribunal. Parties agree that claim for any such interest shall not be considered and shall be void. The Arbitrator



/ Tribunal shall have no right to award pre-reference or pendente-lite interest in the matter.

11. The arbitral tribunal shall make and publish the award within time stipulated as under:

Amount of Claims and Counter Claims (excluding interest)	Period for making and publishing of the award (counted from the date of first meeting of the arbitrators):
Upto Rs. 5 Crore	Within 8 months
Above Rs. 5 Crore	Within 12 months

The above time limit can be extended by the arbitrator, for reasons to be recorded in writing, with the consent of the parties.

12. The fees payable to each Arbitrator shall be as per rules framed by the High Court in whose territorial jurisdiction as per contract and seat of arbitration is situated. In case no rules have been framed, the fees prescribed may be as per Fourth Schedule of the Arbitration and Conciliation Act, 1996. However, Arbitrator may fix their fees keeping the aforesaid schedule as guiding factor.
13. The parties may, after invocation of dispute, agree for sharing the cost of Arbitration equally on 50:50 basis.
14. If after commencement of the Arbitration proceedings, the parties agree to settle the dispute mutually or refer the dispute to conciliation, the arbitrators shall put the proceedings in abeyance until such period as requested by the parties. Where the proceedings are put in abeyance or terminated on account of mutual settlement of dispute by the parties, the fees payable to the arbitrators shall be determined as under:
- (i) 20 % of the fees if the claimant has not submitted statement of claim.
  - (ii) 40 % of the fees if the pleadings are complete.
  - (iii) 60% of the fees if the hearing has commenced.
  - (iv) 80% of the fees if the hearing is concluded but the award is yet to be passed
15. Each party shall pay its share of arbitrator's fees in stages as under:
- (i) 20% of the fees on filing of reply to the statement of claims.
  - (ii) 40% of the fees on completion of pleadings.
  - (iii) 20% of the fees on conclusion of the final hearing.
  - (iv) 20% at the time when award is given to the parties.
16. Each party shall be responsible to make arrangements for the travel and stay etc of the arbitrator appointed by it. Claimant shall also be responsible for making arrangements for travel / stay arrangements for the Presiding Arbitrator and the expenses incurred shall be shared equally by the parties. In case of sole arbitrator,

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MRPL shall make all necessary arrangements for his travel stay and the expenses incurred shall be shared equally by the parties.

17. The Arbitration shall be held at the place from where the contract has been awarded. However, parties to the contract can agree for a different place for the convenience of all concerned.
18. The Arbitrator(s) shall give reasoned and speaking award and it shall be final and binding on the parties.
19. Subject to aforesaid, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modification or re-enactment thereof shall apply to the arbitration proceedings under this clause.
20. Insofar as practicable, the Parties shall continue to implement the terms of the Contract notwithstanding the initiation of Arbitration proceedings.

#### 9.0.2.1 Arbitration Clause applicable in case of Purchase Orders/ Contracts on Public Sector Enterprises

Ref: No.4 (1) /2011-DPE (PMA)-GL, Government of India, Department of Public Enterprises. Dated 12th June 2013

In the event of any dispute or difference relating to, arising from or connected with the CONTRACT, such dispute or difference shall be referred by either party to the arbitration of one of the Arbitrators in the Department of Public Enterprises, to be nominated by the Secretary to the Government of India, In charge of the Bureau of Public Enterprises.

The Arbitration and Conciliation Act 1996 shall not be applicable to the Arbitration under this clause.

The award of the Arbitrator shall be binding upon the parties to the dispute, provided however; any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Deptt. of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary / Additional Secretary, whose decision shall bind the parties finally and conclusively.



The parties in the dispute will share equally the cost of the arbitration as intimated by the Arbitrator.

#### 9.0.3.0 JURISDICTION:

Contract / Purchase Order, including all matters connected with this Contract / Purchase Order shall be governed by the Indian law both substantive and procedural, for the time being in force and shall be subject to the exclusive jurisdiction of Indian Courts at Mangalore.

Foreign companies, operating in India or entering into Joint ventures in India, shall have to obey the law of the land and there shall be no compromise or excuse for the



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ignorance of the Indian legal system in any way.

**Annexure D to Clause 9.0.1.0 - Conciliation**

**Declaration of independence and impartiality by OEC Member**

To,

1. MRPL .....
2. Contractor.....

**Subject: Declaration of independence and impartiality by OEC Member in the dispute between MRPL .....And.....under Contract No.....**

I, the undersigned, hereby accept to act as Member of the Expert Committee and conciliate in the disputes under reference between the parties above named.



I confirm that I am aware of the requirements of law particularly of the Arbitration and Conciliation Act, 1996, to act as a conciliator. I am able to act as conciliator and I am available to act as Member of the Expert Committee.

I hereby declare that I am independent of each of the parties and have no ownership interest in any part of the contract under reference or any financial interest in the said contract. I have no interest in the outcome of the dispute or its settlement.

I hereby affirm that I shall act with honesty, integrity, diligence, and will remain independent and impartial while discharging my duties as conciliator/OEC Member. I will disclose any interest or relationship with the parties or the subject matter which might compromise in any manner my ability or capacity to remain impartial and independent in the matter.

The fees and other facilities offered to me and the terms and conditions contained in the appoint letter and guidelines issued by MRPL are acceptable to me. I will not demand for enhancement of the same.

(Signature  
 ) Name:  
 Address:  
 Phone:  
 Email:  
 Date:

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**Annexure E to Clause 9.0.1.0 - Conciliation**

**STATEMENT OF CLAIM(S)/COUNTERCLAIM(S)**

1. Chronology of the dispute
2. Brief of the contract
3. Brief history of the dispute:
4. Issues:
5. Details of claim(s)/Counter Claim(s):

SI NO	Description of claim(s)/ Counter Claim	Amount(in INR/USD)	Relevant Clause

1. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract) Statement of claims may kindly be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of claims. The statement of claims is to be submitted to all OEC members, to other party and to the office of Head Legal Services-MRPL, by post as well as mail.

**Authorized Signatory of the Claimant**

**Place:**

**Contact No. :**

**Date:**



**Email:**

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## SECTION 10

### SAFETY CODE

- 10.0.0.0 GENERAL
- 10.0.1.0 CONTRACTOR shall adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with OWNER's safety rules as set forth herein.
- 10.0.2.0 In addition, the contractor shall adhere to and be bound by the "Safety Practices During Construction" (OISD-GDN-192) formulated by the Oil Industry Safety Directorate from time to time. A copy of the existing "Safety Practices During Construction" as presently formulated by the Oil Industry Safety Directorate is annexed hereto as Appendix III.
- 10.0.3.0 In the event of any irreconcilable conflict between the "Safety Practices during Construction" prescribed by the Oil Industry Safety directorate and the Safety provisions set out herein, the "Safety Practices During Construction" established by the Oil Industry Safety Directorate shall prevail to the extent of the irreconcilable conflict.
- 10.1.0.0 FIRST AID AND INDUSTRIAL INJURIES:
- 10.1.1.0 CONTRACTOR shall maintain first aid facilities for its employees and those of its sub- contractors.
- 10.1.2.0 CONTRACTOR shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to Engineer-in-charge prior to start of construction, and their telephone numbers shall be prominently posted in CONTRACTOR's field office.
- 10.1.3.0 All critical industrial injuries shall be reported promptly to Engineer-in-charge, and a copy of CONTRACTOR's report covering each personal injury requiring the attention of a physician shall be furnished to OWNER.
- 10.2.0.0 GENERAL RULES:
- 10.2.1.0 Carrying/Striking of matches, lighters inside the refinery area, smoking within the refinery, tank farm, or dock limits are strictly prohibited. Violators of the "No Smoking" rules shall be discharged immediately. Within the operation area, no hot work shall be permitted without valid gas safety/fire permits. The CONTRACTOR shall be held responsible for all lapses of his sub-contractors/ employees in this regard.
- 10.3.0.0 CONTRACTOR's BARRICADES

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- 10.3.1.0 CONTRACTOR shall erect and maintain barricades required in connection with his operation to guard or protect:
- (i) Excavation
  - (ii) Hoisting areas
  - (iii) Areas adjudged hazardous by CONTRACTOR's or OWNER's inspectors.
  - (iv) OWNER's existing property liable to damage by CONTRACTOR's operations, in the opinion of Engineer-in-Charge/Site Engineer.
  - (v) Railroad unloading spots.
- 10.3.2.0 CONTRACTOR's employees and those of its sub-contractors shall become acquainted with OWNER's barricading practice and shall respect the provisions hereof.
- 10.3.3.0 Barricades and hazardous areas adjacent to but not located in normal routes of travel shall be marked by red flasher lanterns at nights.
- 10.4.0.0 SCAFFOLDING:
- 10.4.1.0 Suitable scaffolding shall be provided for workmen for all works that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal 4 vertical).
- 10.4.2.0 Scaffolding or staging than 12', above the ground floor, swing or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise rewinded at least 3', high above the floor or platform of scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- 10.4.3.0 Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally and if the height of platform or the gangway or the stairway is more than 12', above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in Clause 10.4.2.0 above.
- 10.4.4.0 Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 3 feet.
- 10.4.5.0 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 30' in length while the width between the side rails in rung ladder shall in no case be less than 11.5" for ladder up to and including 10' in length for longer ladders this width would be increased at least ¼" for each additional foot of length. Uniform step spacing shall not exceed 12". Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the

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site of work shall be so stacked or placed as to cause danger or inconvenience to any person or public. The CONTRACTOR shall also provide all necessary fencing and lights to protect the workers and staff from accidents and shall be bound to bear the expenses of defence of every suit, action or other proceedings, as law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay damages and costs which may be awarded in any such suit or action or proceedings to any such person, or which may with the consent of the CONTRACTOR be paid to compromise any claim by any such person.

**10.5.0.0 EXCAVATION AND TRENCHING:**

**10.5.1.0** All trenches 4' or more in depth, shall at all times be supplied with at least one ladder for each 100' length or fraction thereof.

**10.5.2.0** Ladder shall be extended from bottom of the trench to at least 3' 3" above the surface of the ground. The site of the trenches which is 5' or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides to collapse.

The excavated material shall not be placed within 5' of the edge of the trench or half of trench depth whichever is more. Cutting shall be done from top to bottom. Under no circumstances shall undermining or undercutting be done.

**10.6.0.0 DEMOLITION**

**10.6.0.0** Before any demolition work is commenced and also during the process of the work all roads and open area adjacent to the work site shall either be closed or suitably protected.

**10.6.1.0** No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.

**10.6.2.0** All practical steps shall be taken to prevent danger to persons employed, from risk of fire or explosion or flooding. No floor, or other part of the building shall be so overloaded with debris or material as to render it unsafe.



**10.7.0.0 SAFETY EQUIPMENT**

**10.7.1.0** All necessary personal safety equipment as considered adequate by the Engineer-in-charge should be made available for the use to the persons employed on the site and maintained in a condition suitable for immediate use, and the CONTRACTOR should take adequate steps to ensure proper use of equipment by those concerned.

**10.7.2.0** Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.

**10.7.3.0** Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.

**10.7.4.0** Those engaged in welding and cutting works shall be provided with protective face and eye shields, and gloves, etc.

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- 10.7.5.0 Stonebreakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- 10.7.6.0 When workers are employed in sewers and manholes, which are in use, the CONTRACTOR shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.
- 10.7.7.0 The CONTRACTOR shall not employ men below the age of 18 years and women on the work of painting or products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
- 10.7.7.1 No paint containing lead product shall be used except in the form of paste or readymade paint.
- 10.7.7.2 Suitable face masks shall be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
- 10.7.7.3 Overalls shall be supplied by the CONTRACTOR to workmen and adequate facilities shall be provided to enable the working painters to wash during and on cessation of work.
- 10.8.0.0 **RISKY PLACES:**
- 10.8.1.0 When the work is done near any place where there is a risk of drowning, all necessary safety equipments shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
- 10.9.0.0 **HOISTING EQUIPMENT:**
- 10.9.1.0 Use of hoisting machines and tackle including their attachments, anchorage and supports shall confirm to the following standards or conditions:
- 10.9.1.1 These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good condition and in good working order
- .
- 10.9.1.2 Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
- 10.9.1.3 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to the operator.
- 10.9.1.4 In case of every hoisting machine and of every chain ring hook, shackle, swivel and pulley block used in hoisting or lowering or as a means of suspension; the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph



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shall be loaded beyond the safe working load except for the purpose of testing.

- 10.9.1.5 In case of departmental machine, the safe working load shall be notified by the Engineer- in-Charge. As regards CONTRACTOR's machines, the CONTRACTOR shall notify the safe working load of the machine to the Engineer-in-charge, whenever he brings any machinery to site of work and gets it verified by the Engineer-in-charge concerned.
- 10.10.0.0 ELECTRICAL EQUIPMENT:
- 10.10.1.0 Motor, Gearing, Transmission, wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum, the risk of accidental descent of the load, adequate precautions shall be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel, such as gloves and boots as may be necessary shall be provided. The workers shall not wear any rings, watches and carry keys or other material, which are good conductors of electricity.
- 10.11.0.0 MAINTENANCE OF SAFETY DEVICES:
- 10.11.1.0 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place of work.
- 10.12.0.0 DISPLAY OF SAFETY INSTRUCTIONS:
- 10.12.1.0 These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at the work spot. The person responsible for compliance of the safety code shall be named therein by the CONTRACTOR.
- 10.13.0.0 ENFORCEMENT OF SAFETY REGULATIONS:
- 10.13.1.0 To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the CONTRACTOR shall be open to inspection by the Welfare Officer, Engineer-in-charge or Safety Engineer of the OWNER or their representative.
- 10.14.0.0 NO EXEMPTION
- 10.14.1.0 Notwithstanding the above Clauses 10.0.0.0 to 10.13.0.0 there is nothing in these to exempt the CONTRACTOR from the operations of any other Act or rules in force in the Republic of India.
- 10.14.2.0 The works through out including any temporary works shall be carried on in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpaths, at the site or in the vicinity thereto or any existing works whether the property of the OWNER or of a third party.

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- 10.14.3.0 In addition to the above, the CONTRACTOR shall abide by the safety code provisions as per CPWD safety code framed from time to time.
- 10.14.4.0 The CONTRACTOR shall also arrange to obtain valid gate passes for his men and equipment from the concerned authorities of the Refinery/Project.
- 10.14.5.0 No man/material/equipment not covered by valid passes shall be permitted within the Refinery/project area and no material/equipment shall be permitted to be taken out of the Refinery/ Project area, unless authorized by the concerned authorities of Refinery Project. The CONTRACTOR shall be held fully responsible for any or all delays/losses/damages that may result consequent on any lapses that may occur on the part of his sub-contractors/employees in this regard.

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## APPENDIX-1



TO

### GENERAL CONDITIONS OF CONTRACT

CONTRACTORS' LABOUR REGULATIONS

(REFERENCE: Clause 8.3.10.0 of GCC)

1. These regulations may be called Model Contractors Labour Regulations.
2. Definition: In these regulations, unless otherwise expressed or indicated, the following words and expressions shall have the meaning hereby assigned to them:
  - (a) "Labour" means workers employed by the contractor, directly or indirectly through a sub- contractor, or by an agent on his behalf to do any skilled, semi-skilled or unskilled manual, supervisory, technical or clerical work.
  - (b) "Fair wage" means wages, which shall include wages for weekly day of rest and other allowances, whether for time or piece work, after taking into consideration prevailing market rates for similar employments in the neighborhood but shall not be less than the minimum rates of wages fixed under the payment of Minimum Wages act.
  - (c) "Wages" shall have the same meaning as defined in the Payment of Wages Act.
  - (d) "Contractor" for the purpose of these regulations shall include an agent or sub-contractor employing labour on the work taken on the contract.
  - (e) "Inspecting Officer" means any Labour Enforcement Officer or Assistant Labour Commissioner of the Chief Labour Commissioner's Organization.
  - (f) "Prescribed" means prescribed under the Contract Labour (Regulation and Abolition) Act 1970 and Rules framed there under.
3. Notice of commencement: The Contractor, shall within SEVEN days of commencement of the work, furnish in writing, to Inspecting Officer of the area concerned the following information:
  - (a) Name and Situation of the work.
  - (b) Contractor's name and address.
  - (c) Particulars of the department for which the work is undertaken.
  - (d) Name and address of sub-contractors as and when they are appointed.
  - (e) Commencement and probable duration of the work.

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- (f) Number of workers employed and likely to be employed.
- (g) “Fair wages” for different categories of workers.
- (i) Number of hours of work to constitute a normal working day: The number of hours, which shall constitute a normal working day for an adult shall be NINE hours. The working day of an adult worker shall be so arranged that it is inclusive of intervals, if any, for rest, it

shall not spread over more than twelve hours on any day. When a worker is made to work for more than NINE hours on any day or for more than FORTY-EIGHT hours in a week; he shall, in respect of overtime work, be paid wages at double the ordinary rate of wages.

- (ii) Weekly day of rest: Every worker shall be given a weekly day of rest which shall normally be a Sunday unless otherwise fixed and notified at least TEN days in advance. A worker shall not be required or allowed to work on the weekly rest day unless he has or will have a substituted rest day, on one of the five days immediately before or after the rest day, provided that no substitution shall be made which will result in the worker working for more than ten days consecutively without a rest day for a whole day.

4. Where, in accordance with the foregoing provisions, a worker works on the rest day and has been given a substituted rest day, he shall be paid wages for the work done on the weekly rest day at the overtime rate of wages.



(NOTE: The expression “ ordinary rate of wages” means the fair wage the worker is entitled to.)

5. Display of notice regarding Wages, Weekly day of Rest etc.: The contractor shall, before the commencement of his work on the Contract, display and correctly maintain and continue to display and correctly maintain in a clean and legible condition in conspicuous places on the works, notice in English and in the local Indian language, spoken by majority of workers, giving the rate or fair wages, the hours of work for which such wages are payable, the weekly rest days workers are entitled to and name and address of the Inspecting Officer, the contractor shall send a copy each of such notices to the Inspecting Officers.

- 6.1 Fixation of Wage Periods: The Contractor shall fix wage periods in respect of which wages shall be payable. No wage period shall normally exceed one month.

- 6.2 Payment of wages:

- (i) Wages due to every worker shall be paid to him direct. All wages shall be paid in current coins or currency or in both. The wages shall be paid without deductions of any kind except those specified by Central Government by General Order or Special Order in this behalf or permissible under the Payment of Wages Act.
- (ii) Wages of every worker employed as contract labour in an establishment or by Contractor where the number of workers is less than one thousand, such workers shall be paid within SEVEN days from the end of the wage period; and before the



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expiry of the 10<sup>th</sup> day from the end of the wage period accordingly as the number of workers exceed 1,000.

- (iii) When employment of any worker is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before expiry of the second working day from the date on which his employment is terminated.
- (iv) All payment of wages shall be made at the work site on a working day except when the work is completed before expiry of the wage period, in which case final payment shall be made at the work site within 48 hours of the last working day and during normal time.

(NOTE: The term “working day” means a day on which labour is employed, and the work is in progress)

7. Register for Workmen: A register of workmen shall be maintained in the prescribed form and kept at the work site or as near to it as possible, and relevant particulars of every workmen shall be entered therein within THREE days of his employment.
8. Employment Card: The Contractor shall issue an employment card in the Form appended to these regulations to each worker on the day of work or entry into his employment. If a worker already has any such card with him issued by the previous employer, the Contractor shall merely endorse that Employment Card with relevant entries. The Contractor may, alternatively, issue an attendance-cum-wage slip to each worker in the form appended. This card shall be valid for a wage period. The Contractor shall mark attendance on the cards twice each day and again after the rest interval, before he actually starts the work. On termination of employment, the Employment card shall again be endorsed by the Contractor, service certificate issued and returned to the Worker.
9. Register of Wages etc.
  - (i) A register of Wages-cum-Muster Roll in the prescribed Form shall be maintained and kept at work site or as near to it as possible.
  - (ii) A wage slip in the prescribed Form shall be issued to every worker employed by the Contractor at least a day prior to disbursement of wages.
10. Fines and deductions which may be made from wages:
  - (i) Wages of a worker shall be paid to him without any deduction of any kind except the following:
    - (a) Fines;
    - (b) Deduction for absence from duty, i.e. from the place of his employment he is required to work. The amount of deductions shall be in proportion to the period for which he was absent;
    - (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money which he is required to account for, where such damage or loss is directly attributable to his neglect or default;
    - (d) Deductions for recovery of advances or for adjustment of overpayment of

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wages.

Advance granted shall be entered in a register; and

- (e) Any other deduction, which the Company may from time to time allow.
- (ii) No fines shall be imposed on any worker say in respect of such acts and omissions on his part as have been approved by the Chief Labour Commissioner or Competent Authority.
- (iii) No fine shall be imposed on a worker and no deductions for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.
- (iv) The total amount of fines which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the wages payable to him in respect of that wage period.
- (v) No fine imposed on a worker shall be recovered from him in installments, or after expiry of sixty days from the date on which it was imposed. Every fine shall be deemed to have been imposed on the day of the act/ or omission in respect of which it was imposed.
- (vi) The contractor shall maintain both in English and the local Indian language, a list approved by the Chief Labour Commissioner or Competent Authority clearly stating the acts and commissions for which penalty or fine may be imposed on a workman and display it in good condition in a conspicuous place on the work site.
- (vii) The Contractor shall maintain a register of fines and the register of deductions for damage or loss in the prescribed Forms, which should be kept at the place of work.
- (viii) The Contractor shall display in a conspicuous place of work the list of acts and omissions for which the fines can be imposed. They are as under:
1. Willful insubordination or disobedience, whether alone or in combination with other.
  2. Theft, fraud or dishonesty in connection with the Contractor's business or property of Owner.
  3. Taking or giving bribes or any illegal gratification.
  4. Habitual late attendance.
  5. Drunkenness, fighting, riotous or disorderly or indifferent behavior.
  6. Habitual negligence.
  7. Smoking near or around the area where combustible or other material are locked.
  8. Habitual indiscipline.
  9. Causing damage to work in the progress or to property of the Owner or of the Contractor.
  10. Sleeping on duty.
  11. Malingering or slowing down work.
  12. Giving of false information regarding name, age, father's name etc.





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13. Habitual loss of wage cards supplied by the employers.
  14. Unauthorized use of employer's property of manufacture or making of unauthorized articles at the work place.
  15. Bad workmanship in construction and maintenance by skilled workers which is not approved by the Owner and for which the Contractor is compelled to undertake rectification.
  16. Making false complaints and/or misleading statements.
  17. Engaging in trade within the premises of the establishments.
  18. Any unauthorized divulgence of business affairs of the employers.
  19. Collection or canvassing for the collection of money within the premises of an establishment unless authorized by the employer.
  20. Holding meeting inside the premises without previous sanction of the employers.
  21. Threatening or intimidating any workmen or employer during the working hours within the premises.
  22. Non-observance of Safety norms/practices applicable to the Worksite.
11. Register of Accidents: The Contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
- (a) Full particulars of the labourers who met with accident.
  - (b) Rate of wages.
  - (c) Sex
  - (d) Age
  - (e) Nature of accident and cause of accident
  - (f) Time and date of accident
  - (g) Date and time when admitted in hospital
  - (h) Date of discharge from the hospital
  - (i) Period of treatment and result of treatment
  - (j) Percentage of loss of earning capacity and disability as assessed by Medical Officer.
  - (k) Claim required to be paid under Workmen's Compensation Act.
  - (l) Date of payment of compensation
  - (m) Amount paid with details of the person to whom the same was paid.
  - (n) Authority by whom the compensation was assessed.
  - (o) Remarks.
12. Preservation of Registers: The Register of Workmen and the Register of wages-cum Muster roll required to be maintained under these Regulations shall be preserved for 3 years after the date of which the last entry is made therein.
13. Enforcement: The Inspecting Officer shall either, on his own motion or on a complaint received by him, carryout investigations and send a report to the Engineer-in-charge specifying the amounts representing Workers' dues and amount of penalty to be imposed



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on the Contractor for breach of these Regulations, that have to be recovered from the Contractors, indicating full details of the recoveries proposed and the reasons therefore. It shall be obligatory on the part of the Engineer-in-charge on receipt of such a report to deduct such amounts from payments due to the Contractor.



14. Disposal of amounts recovered from the Contractor: The Engineer-in-charge shall arrange payment to workers concerned within FORTY-FIVE days from receipt of a report from the Inspecting Officer. In cases where there is an appeal, payment of workers dues would be arranged by the Engineer-in-charge wherever such payments arise, within THIRTY days from the date of receipt of the decision of the Regional Labour Commissioner (RLC).
15. Appeal against decision of Inspecting Officer: Any person aggrieved by a decision of the Inspecting Officer may appeal against such decision to the RLC concerned within THIRTY days from the date of decision, forwarding simultaneously a copy of his appeal to the Engineer-in-charge. The decision of the RLC shall be final and binding upon the Contractor and the workmen.
16. Representation of parties:
  - (i) A workman shall be entitled to be represented in any investigation or enquiry under these Regulations by an officer of a registered trade union of which he is a member or by an officer of a Federation of Trade Unions to which the said trade union is affiliated or where the workman is not a member of any registered trade union, by an officer of a registered trade union, connected with, or by any other workman employed in the industry in which the worker is employed.
  - (ii) A contractor shall be entitled to be represented in any investigation of enquiry under these Regulations by an officer of an Association of Contractors of which he is a member or by an officer of a Federation of Association of Contractors to which the said association is affiliated or where the Contractor is not a member of any Association of Contractors, by an officer of association of employers, connected with, or by any other employer engaged in, the industry in which the Contractor is engaged.
  - (iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these Regulations.
17. Maternity benefits for female employees: The Contractor shall extend the leave, pay and other benefits as admissible to the female employees. No maternity benefits shall be admissible to a female worker unless she has been employed for a total period of not less than 6 months immediately preceding the date on which she proceeds on leave. The contractor shall maintain a register of maternity benefits in prescribed form, which shall be kept in all places of work.
18. Inspection of Books and other documents: The Contractor shall allow inspection of the Registers and other documents prescribed under these Regulations by Inspecting Officers and the Engineer-in-charge or his authorized representative at any time and by the worker or his agent on receipt of due notice at the convenient time.
19. Submission of Returns: The Contractor shall submit periodical returns as may be specified from time to time.
20. Amendments: The Owner may, from time to time, add to or amend these Regulations,

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and issue such directions as it may consider necessary for the proper implementation of these regulations or for the purpose of removing any difficulty which may arise in the administration thereof.

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**APPENDIX - II TO THE GENERAL CONDITIONS OF CONTRACT**

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1. Definitions

**MODEL RULES FOR LABOUR WELFARE**

(Refer: Clause 8.3.10.0 of GCC)

- (a) “Workplace” means a place at which, on an average, twenty or more workers are employed on any day during which the Contract work is in progress.
- (b) “Large Workplace” means a place at which, on an average 500 or more workers are employed.

2. First Aid



- (i) At every workplace, there shall be provided and maintained in a readily accessible place First Aid appliances including an adequate supply of sterilized dressings and sterilized cotton wool as prescribed in the Factory Rules of the State in which the work is carried on. The appliances shall be kept in good order and in large work places, they shall be placed under the charge of a responsible person who shall be trained in First Aid treatment and who shall also be readily available during working hours. The first aid boxes at the rate of not less than one box for 150 contract labour or part thereof shall be ordinarily employed. Adequate arrangement shall be made for immediate recoupment of items/equipment when necessary.
- (ii) At large work place, where hospital facilities are not available within easy distance of the Works, First Aid posts shall be established and be run by a trained compounder.

Where large work places are remotely situated far away from regular hospitals, an indoor ward shall be provided with one bed for every 250 employees.

Where large work places are situated in cities, town or in their suburbs and no beds are considered necessary owing to proximity of city or town hospitals, suitable transport shall be provided to facilitate removal of urgent cases to these hospitals. At other workplaces, some conveyance shall be kept readily available to take injured person or persons suddenly taken seriously ill to the nearest hospital.

At large work places, there shall be provided and maintained an ambulance room of the prescribed sizes, containing the prescribed equipment and in the charge of such medical and nursing staff as may be prescribed. For this purpose, the relevant provisions of the Factory Rules of the State Government area where the work is carried on may be taken as the prescribed standard.

3. Accommodation for labour: The Contractor shall during the progress of the Works,

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provide, erect and maintain necessary temporary living accommodation and ancillary facilities for labour at his own expense and to standard and scales as approved by the Engineer-in-charge. However, following specifications shall be followed:

- (a)
  - (i) The minimum height of each hut at the eaves level shall be 2.10m (7ft) and the floor area to be provided will be at the rate of 2.7 sq.m (30 sq.ft.) for each member of the worker's family staying with the labourer.
  - (ii) The Contractor shall in addition construct suitable cooking places having a minimum area of 1.80m X 1.50m (6'x5') adjacent to the hut for each family.
  - (iii) The Contractor shall also construct temporary latrines and urinals for the use of the labourers, each on the scale of not less than four per each one hundred of the total strength. Separate latrines and urinals have been provided for women.
  - (iv) The Contractor shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These washing and bathing places shall be suitably screened.
- (b)
  - (i) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local material as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobi on both sides. The floor may be katcha, but plastered with mud gobi and shall be at least 15 cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-charge and the Contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight.
  - (ii) The Contractor shall provide each hut with proper ventilation.
  - (iii) All doors, windows and ventilators shall be provided with suitable leaves for security purposes.
  - (iv) There shall be kept an open space at least 7.2 m (8 yards) between the rows of huts, which may be reduced to 6m (20ft) according to the availability of site with the approval of the Engineer-in-charge. Back to back construction will be allowed.

4. **Drinking Water:** In every workplace, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

Where drinking water is obtained from an intermittent public water supply, each workplace shall be provided with storage where drinking water should be stored.

Every water supply storage shall be at a distance of not less than 15 meters from any latrine, drain or other source or pollution. Where water has to be drawn from an existing well, which is within such proximity of latrine, drain or any other source of pollution,



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the well shall be properly chlorinated before water is drawn for drinking. All such wells shall be entirely closed in and be provided with a trap door, which shall be dust and waterproof.

A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. Washing and Bathing Places: adequate washing and bathing places shall be provided separately for men and women. Such places shall be kept in clean and drained conditions.
6. Scale of accommodation in latrines and urinals: There shall be provided within the precincts of every workplace, latrines and urinals in an accessible place and the accommodation separately for each of these, shall not be less than at the following scales:  
No. of seats
  - (a) Where number of persons does not exceed 50 - 2
  - (b) Where number of persons exceeds 50 but does not exceed 100 - 3
  - (c) For additional persons - 3 per 100 or part thereof

In particular cases, the Engineer-in-charge shall have the power to increase the requirement, where necessary.

7. Latrines and Urinals: Except in workplaces provided with water-flushed latrines connected with a water-borne sewage systems, all latrines shall be provided with receptacles on dry earth system which shall be cleaned at least four times daily and at least twice during working hours and kept in strictly sanitary condition. Receptacles shall be tarred inside and outside at least once a year.

If Women are employed, separate latrine & urinals screened from doors for men and marked in the vernacular inconspicuous letters "FOR WOMEN ONLY" shall be provided on the scale laid down in Rule- 6. Those for men shall be similarly marked "FOR MEN ONLY". A poster showing the figure of a man and a woman shall also be exhibited at the entrance to latrines for each sex. There shall be adequate supply of water close to latrines and urinals.

8. Construction of latrines: Inside walls shall be constructed of masonry or other non-absorbent materials and shall be cement-washed inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for the purpose and kept available for inspection. Latrines shall have at least thatched roof.
9. Disposal of excreta: Unless otherwise arranged for by the local municipal authority, arrangement for proper disposal of excreta by incineration at the workplace shall be made by means of a suitable incinerator approved by the local medical, health and medical or cantonment authorities. Alternatively, excreta may be disposed off by putting a layer of night soils at the bottom of pucca tank prepared for the purpose and covering it with a 15 c.m. Layer of waste or refuse and then covering it with a layer of

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earth for a fortnight (when it will turn into manure).



The Contractor shall, at his own expense, carry out all instructions issued to him by the Engineer-in-charge to effect proper disposal of soil and other conservancy work in respect of Contractor's work people or employees at the site. The Contractor shall be responsible for payment of any charges, which may be levied by municipal or cantonment authority for execution of such work on his behalf.

10. Provision of shelters during rest: At every workplace shall be provided, free of cost, for suitable sheds, two for meals and two others for rest, separately for use of men and women labour. Height of each shelter shall not be less than 3 meters from the floor level to lowest part of roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 0.5 sq.m per head.
11. Creches: At a place at which 20 or more women workers are ordinarily employed, there shall be provided at least one hut for use of children under the age of 6 years belonging to such women. Huts shall not be constructed to a standard lower than that of thatched roof, mud floor and wall with wooden planks spread over mud floor and covered with matting.

Huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean. There shall be two dais in attendance. Sanitary utensils shall be provided to the satisfaction of local medical, health and municipal or cantonment authorities. Use of huts shall be restricted to children, their attendants and mothers of children.



Where the number of women workers is more than 25 but less than 50, the Contractor shall provide at least one hut and one Dai to look after the children of women workers. Size of crèche(s) shall vary according to the number of women workers employed. Creche(s) shall be properly maintained and necessary equipment like toys etc. provided

12. Canteen: A cooked food canteen one moderate scale shall be provided for the benefit of workers wherever it is considered necessary.
13. Planning, setting and erection of the above mentioned structures shall be approved by the Engineer-in-charge and the whole of such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition as per requirements of the local bodies and to the satisfaction of the Engineer-in-charge and at the Contractor's expense. The Contractor shall conform generally to sanitary requirements of local medical, health and municipal of cantonment authorities and at all time adopt such precautions as may be necessary to prevent soil pollution of the site. On completion of the Work, the whole of such temporary structures shall be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively

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sealed off and the whole of site left clean and tidy to the entire satisfaction of the Engineer-in-charge and at the Contractor's expense.

14. Anti-material precautions: The Contractor shall, at his own expense, conform to all anti-material instructions given to him by the Engineer -in-charge, including filling up any burrow pits which may have been dug by him.
15. Enforcement: The Inspecting Officer mentioned in the Contractor's Labour Regulations or any other officer nominated in his behalf by the Engineer-in-charge shall report to the Engineer-in-charge all cases of failure on the part of the Contractor and or his sub-Contractor to comply with the provisions of these Rules either wholly or in part and the Engineer-in-Charge shall impose such fines and other penalties as are prescribed in the conditions.
16. Interpretations etc: On any question as to the application, interpretation of effect of these Rules, the decision of the Chief Labour Commissioner or Deputy Chief Labour Commissioner (Central) shall be final and binding.
17. Amendments: Government/ OWNER may, from time to time, add to or amend these rules and issue such directions, as it may consider necessary for the proper implementation of these Rules or for the purpose of removing any difficulty, which may arise in the administration thereof.



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## INSTRUCTIONS TO TENDERERS

- 1.0 Mangalore Refinery and Petrochemicals Limited, a company registered in India under the Companies Act, 1956, through its \_\_\_\_\_ (give the designation of the authority calling for tenders) invites tenders under sealed covers from bona fide and experienced CONTRACTORS of financial standing and reputation for the following job(s) :
- (a) name of work
  - (b) name of location
  - (c) Unit/region/division etc., (more specifically described in the Tender Documents, upon the terms and conditions mentioned in the Tender Documents).
- 2.0 The Tender Documents shall consist of the following:
- (i) Invitation to Tender
  - (ii) Instructions to the Tenderers
  - (iii) General Conditions of Contract
  - (iv) Special Conditions of Contract (including Scope of Work and Time Schedule)
  - (v) Special Instructions to Tenderers
  - (vi) Specifications
  - (vii) Plans (Exhibits.....to.....)
  - (viii) Drawings (Exhibits.....to.....)
  - (ix) Form of Contract
  - (x) Form of Tender (including formats annexed to the Form of Tender)
  - (xi) Form of Schedule of Rates
  - (xii) Addendum/Addenda to Tender Documents.
- 3.0 Price of Tender Documents
- (a) The Price of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) payable for the Tender Documents is made up as follows:

Prices for use of Tender Document : Rs. \_\_\_\_\_

Less paid by OWNER to tenderer by way of adjustment to keep the Tender offer open : Rs. \_\_\_\_\_

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Balance : Rs. \_\_\_\_\_



- (b) The price of the Tender Documents is the net cost/ price per set of Tender Document, after accounting for the consideration paid by the OWNER to the tenderer, for keeping the tenders valid for the prescribed period, and any extension thereof.

#### 4.0 Tender Instructions

- 4.1 Tender Documents shall remain the property of the OWNER. Not more than 2 (two) copies of the Tender Documents will be issued to any one intending tenderer, unless otherwise specified. The Tender Document issued to one party cannot be transferred to or used by another without the specific written permission of the tender issuing authority.
- 4.2 The Tender shall be completely filled in all respects and shall be tendered together with requisite information and annexures. Any tender incomplete in particulars shall be liable to be rejected.
- 4.3 If the space in the Tender or any schedule or annexure thereof is insufficient, pages shall be separately added. These shall be consecutively page- numbered and also shall carry the Tender Document numbered and shall be signed by the tenderer and entered in the Index for the Tender.
- 4.4 (a) The Tender with one or more complete sets of the Tender Documents, as required, shall be enclosed in a sealed cover superscribed with name of work and tender notice number and addressed and sent by registered post to the Tender Receiving Authority specified in the Invitation to Tender, or put in the Tender Box designated for the specific work located at the address specified in the Invitation to Tender. In case tenders have been called for in two parts separately viz., the technical and commercial part, and the price part, these two parts shall be put in two separate sealed covers superscribed “technical commercial part” and “price part” respectively. Both the sealed covers thereafter shall be then put inside another sealed cover, superscribed with the name of the work, the tender notice number and date, due date for receipt of tenders, the name of the Tender, etc., and sent either by registered post or dropped in the tender box designated for the purpose, located at the address specified in the Tender Document.
- (b) Where two copies of Tender Documents have been called for they should be put in two separate envelopes duly marked as ‘original’ and ‘copy’. Both these sealed envelopes should then be put together inside another sealed envelope suitably superscribed.
- 4.5 The sealed tenders must reach the Tender receiving Authority, at the address specified in the Invitation to Tender before the time limit specified therein.
- 4.6 The Tenders shall be opened on the date and at the time specified in the Invitation to Tender or as soon thereafter as convenient, in the presence of such tenderers as may be present. Tenders not received in time may not be considered.
- 4.7 Tenderers shall set their quotations in firm figures and without qualifications or variations or additions in the terms of Tender Documents. Tenders containing qualifying expressions such as “subject to minimum acceptance” or “subject to prior sale”, or any other qualifying

**Tender no:320000590**

**Bidder’s Seal & Signature**

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expression or incorporating terms and conditions at variance with the terms and conditions incorporated in the Tender Documents shall be liable to be rejected.

4.8 The tenders, as submitted, shall consist of the following:

- (i) Complete set of Tender Documents (including addenda, if any) duly filled in and signed by the tenderers as prescribed in different clauses of the Tender Documents.
- (ii) Schedule of rates in the Form of Schedule of Rates.
- (iii) Earnest money amounting to and in the manners specified in clause 5 hereof.
- (iv) Power of Attorney or other proof of authority, in favour of the person who has signed the tender (or copy thereof duly attested by a Gazetted Officer), as required by Clause 4.13 hereof.
- (v) Income Tax Clearance Certificate (in the case of Indian Bidders).
- (vi) Audited Balance Sheets for the last 3 (three) years.
- (vii) Form of Tender
- (viii) Information regarding tenderers in the form annexed to the Form of Tender.
- (ix) Information regarding the tenderer's work of comparable nature in the form annexed to the Form of Tender.
- (x) Information regarding construction, organization and equipment in the form annexed to the Form of Tender.
- (xi) Solvency certificate from a Schedule bank in India or a reputed Foreign Bank acceptable to the OWNER.
- (xii) Declaration of Blacklisting in the prescribed format.

4.9 (a) The OWNER reserves the right to reject, accept or prefer any tender or to abort the bidding process without assigning any reason whatsoever.

(b) Although ordinarily the lowest responsive bid amongst the bids submitted by tenderers and considered by the OWNER as qualified and competent shall be preferred, the OWNER reserves the right not to accept the lowest bid if in its opinion this would not be in the interest of the work.

(c) If the OWNER in its discretion considers that the interest of the work requires a split, the OWNER may split the works between two or more tenderers.

4.10 The tender shall be irrevocable up to the expiry of 4 (four) months from the date of opening of tenders. In case of a 2 (two) bid system the 4 (four) month period shall be reckoned from the date of opening of the techno-commercial bid.

4.11 Rates to be in Figures and Words:

The tenderer shall quote in English both in figures as well as in words the amount tendered by him in the Form of Schedule of Rates forming part of the Tender Documents, in such a way that is interpolation not possible. If the parties do not quote both in figures and words properly and correctly, their tenders are liable to be rejected. The amount for each item shall be worked out and entered and requisite total given of all items. The tendered amount for the work shall be entered in the tender duly signed by the tenderer. If some discrepancies are found between the rates given in words and figures of the amount shown in the tender, the following procedure shall be applied:

(a) When there is a difference between the rates in figures and words, the rate which



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corresponds to the amount worked out by the tenderer shall be taken as correct.

- (b) When the rate quoted by the tenderer in figures and words tallies but the amount is incorrect, the rate quoted by the tenderer shall be taken as correct.
- (c) When it is not possible to ascertain the correct rate in the manner prescribed above the rate as quoted in words shall be adopted.

#### 4.12 Corrections and Alterations

Tenderers are required to fill in the Tender Documents with all due care, avoiding cuttings/ corrections/alteration/overwriting etc. in the entries, as far as possible. In case corrections/ alterations become unavoidable or inevitable, the entry to be corrected, altered should be neatly cancelled or scored through by striking the entry by drawing a line through it and making the revised/corrected entry as close to the cancelled entry as possible, each such cancellation and correction/alteration being clearly and unambiguously authenticated by the Tenderer by his full signatures. Overwriting and/or erasing with or by the application of correcting/erasing fluid(s) will not be permitted and shall render the Tender for rejection.

#### 4.13 Signing of Tender



- (i) The tender shall contain the name, residence and place of business of the person(s) making the tender and shall be signed by the tenderer with his usual signature. Partnership firms shall furnish the full names of all partners in the tender, and shall annex a copy of the Partnership deed to the tender. It shall be signed in the partnership name by the partners or by a duly authorized representative followed by the name and designation of the person signing. Tenders by OWNER shall be signed in the name of the OWNER by a person duly authorized to do so.
- (ii) The person signing the tender shall state his capacity and also the source of his ability to bind the tenderer. The power of attorney or authorization or other document constituting adequate proof of the ability of the signatory to bind the tenderer shall be annexed to the tender. The OWNER may reject outright any tender unsupported by adequate proof of the signatory's authority.
- (iii) When a tenderer signs a tender in a language other than English, the total amounts tendered should in addition be written in the same language. The signature should be attested by at least one witness.

#### 4.14 Witness:

Name, occupations and addresses of the Witnesses shall be stated below their signature. Witnesses shall be persons of status.

#### 4.15 All pages to be initialed:

All signatures in the Tender Documents shall be dated as well. All pages of all sections of Tender Documents shall be initialed at the lower right hand corner or signed wherever required in the Tender Documents by the tenderer or by a person holding power of attorney authorizing him to sign on behalf of the tenderer before submission of tender.

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4.16 Canvassing

Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the tenderers who resort to canvassing shall be liable to rejection.

4.17 Past Experience

The tenderer shall enclose documents to show that he has previous experience in having successfully completed in the recent past works of similar nature together with the name of OWNER, location of sites and value of contract in the format annexed to the Form of Tender. It shall be the responsibility of the Tenderers to fill complete, correct and accurate information in line with the requirements/stipulations of the Tender Document, regarding their past experience and other information required to facilitate due evaluation/consideration of their tenders. In case any essential information given by a bidder is found to be incorrect or a misrepresentation, the bid is likely to be rejected as not responsive, and if the bid has resulted in a contract, the contract is liable to be terminated pursuant to the provisions of Clause 7.0.1.0 of the General Conditions of Contract with consequences of termination as provided in section 7 of the General Conditions of Contract.

4.18 P.F. Code number to be furnished

The tenderer(s) shall indicate his/their P.F. Code Number in the Form of Information about Tender annexed to the Form of Tender. In the absence of the same, the tender shall be liable to be rejected.

4.19 Form of Earnest Money to be deposited:

A bank Guarantee may be accepted by the OWNER towards Earnest Money Deposit of Security deposit or otherwise, as the case may be, provided the amount of such Bank Guarantee is not less than Rs.1 (one) lakh. Such Bank Guarantee shall be issued by a scheduled bank in India acceptable to the OWNER and shall be strictly in the format prescribed by the OWNER for the specific purpose for which the Bank Guarantee is required to be furnished.



4.20(a) Each tenderer/bidder shall give a declaration in the prescribed format annexed to the Form of Tender that he/it/they is/are not under any blacklist declared by the OWNER or by any Department of the State of Central Government or by any other Public Sector Organization and that there is no inquiry in respect of any corrupt or fraudulent practice pending against him/it/them. In case he/it/they are under any such list, or any inquiry is pending he/it/they shall in the declaration give full details thereof. Such declaration in respect of a partnership firm or association of persons shall cover every partner or member of the association, and in the case of company, shall cover every Director and Principal Shareholder of the Company and any Holding Company and/or subsidiary Company(ies) if any.

(b) If a tenderer is on any such list or if any such inquiry is pending against it/him/them or

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if the Bidder makes a false declaration, the OWNER reserves the right to reject the Bid, and if the Bid has resulted into a contract, the contract is liable to be terminated pursuant to the provisions of Clause 7.0.1.0 of the General Conditions of Contract.

- 4.21 In case pre-qualification of potential bidders/tenderers had been undertaken earlier and completed for the work, only bids from pre-qualified bidders will be considered for evaluation and award of the contract. It shall be incumbent on the tenderer to submit necessary evidence of having been pre-qualified for the particular job in question or part thereof, by submitting copies of intimation received from the OWNER/consultant intimating about their being pre qualified.
- 4.22. In case no pre-qualification of bidder/tenderers had been undertaken by the OWNER/consultant, the tenderer shall include full details in support of their capacity, capability and financial standing for taking up and completing the work successfully.
- 4.23. Each tenderer can submit only one tender bid for one package. The names of specialized sub- contractor(s) may, however, appear in different offers submitted by different tenderers.
- (a) It is clarified that a person shall be deemed to have submitted more than one bid if a person bids in an individual or proprietorship format and/or in a partnership or association of persons format and/or in a Company format.
- (b) A company shall for this purpose include any artificial person whether constituted under the laws of Indian or of any other country.
- (c) A person shall be deemed to have bid in a partnership format or in association of persons format if he is a partner of the firm which has submitted the bid or is a member of any association of persons, which has submitted a bid.
- (d) A person shall be deemed to have bid in a company format if, the person holds more than 10% (ten percent) for the voting share capital of the company which has submitted a bid, or is a Director of the company which has submitted a bid, or holds more than 10% (ten percent) of voting share capital and/or is a Director of a holding Company which has submitted the bid.
- 5.0 Earnest Money
- 5.1 The tenderer shall, as a condition for the consideration of the tender, pay the sum specified in Invitation to Tender in the manner specified therein. In the case of cash deposit, he shall attach the official receipt with the tender. The tender is liable to be rejected for failure to deposit money in the manner aforesaid or for failure to furnish proof of having deposited earnest money along with the tender.
- 5.2 The Earnest Money of unsuccessful tenderer(s) shall be refunded without interest only after the award of the work is finalized.
- 5.3 The Earnest Money deposited by a successful tenderer shall be forfeited if the successful tenderer fails to deposit or furnish the requisite Security deposit as specified in the General Conditions of Contract and/or fails to commence work at each job site within 10 (ten) days of handing over the job or any part thereof to him and/or fails to execute the contract in accordance with the Form of Contract within 10(ten) days of receipt of

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Letter of Acceptance in this behalf from the ONWER or within such extended period as may be permitted by the OWNER for the purpose.

- 5.4 (a) A tenderer who has submitted his/it/their bid shall not be permitted to alter/amend or withdraw his/it/their bid after submission of bid, notwithstanding that the bid(s) has/have not yet been opened.
- (b) A tenderer who purports to alter/modify or withdraw his/its/their bid/offer after submission, within the period during which he/it/they promised to keep his/its/their bid valid, shall be liable to have his/its/their tender rejected and his/its/their Earnest Money deposit or Bank Guarantee submitted by way of Earnest Money forfeited / encashed.
- (c) A bidder who offers unsolicited reduction in the price offer whether before or after the opening of the price part of the tender(s)/bid(s) shall be liable to have his/its /their bid(s) rejected. Bidders may, however, at any stage offer a reduction if such reduction is solicited or if the OWNER gives the Bidder an opportunity to offer such reduction.
- 6.0 Cost of Preparation and Submission of Bids
- 6.1 The tenderer shall prepare the tender at his/its/their own risk and shall bear all the costs of preparing and submitting his/its/their tenders, as well as all other costs of tendering for the work and the OWNER shall take no liability for these costs.
- 7.0 Addenda
- 7.1 Addenda to the Tender Documents may be issued prior to the date of opening of the tender (and in the case of 2(two) bid system, prior to the date of opening the price part of the bid) to clarify documents or to reflect modifications in the design or contract terms.
- 7.2 Such addendum(s) issued shall be distributed in duplicate, to each person or organization to whom Tender Documents have been issued. Each recipient will retain one signed copy of such addendum(s) for submission along with his tender and return one signed copy to the authority inviting tenders as acknowledgement of receipt of the addendum. All such addendum(s) issued shall form part of Tender Documents.
- 8.0 Retired Company Directors
- 8.1 No Director of the OWNER is allowed to tender for a period of 2 (two) years after his retirement from the employment of the OWNER, without the previous permission of the OWNER. The Contract if awarded is liable to be cancelled if the tenderer is found at any time to be such a person and has not obtained the permission of the OWNER before submission of the tender. Any tender by a person aforesaid shall carry a disclosure thereof on the tender, and shall be accompanied by a copy of the document by which the requisite consent is given. Such disqualifications shall apply to every partner of a partnership firm.
- 8.2 The tenderer is required to state whether he is a relative of any Director of the OWNER, or whether the tenderer is a firm, whether a Director of the ONWER or relative of such Director is a

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partner in the firm, or whether the tenderer is a Company, whether a Director of the OWNER or relative of such Director is a substantial member holding more than 10% (ten percent) of the paid up capital in the Company, or a Director of the Company.

#### 9.0 Quotations

9.1 The tenderer shall quote for the jobs on the basis of the items entered in the Form of Schedule of Rates, and shall quote separately for each and every item(s) entered in the Form of Schedule of rates.

9.2 The prices quoted shall be all inclusive as provided for in respect of Schedule of Rates in the General Conditions of Contract and the OWNER shall not entertain any claim(s) for enhancement of the price(s) on any account whatsoever.

#### 10.0 Information

10.1 The information given in the Tender Documents and the Plans and Drawings forming part thereof is merely intended as a general information without undertaking on the part of the OWNER as to their accuracy and without obligation relative thereto upon the OWNER. The tenderers are expected to conduct their own surveys and investigations prior to tendering.

10.2 All information disclosed to the tenderers by way of the Tender Documents shall be considered confidential and shall not be disclosed to any party by the tenderers except as may be necessary for carrying out the work. Where it is found that any tenderer has violated and has disclosed sensitive and vital information impugning on the security of the installation/national security, necessary action, as may be called for, may be taken against the tenderer concerned in addition to his being liable to be black listed and/or barred from participating in future bids.

10.3 The tenderer shall before tendering and shall be deemed before tendering to have undertaken a thorough study of the proposed work, the job site(s) involved, the site conditions, soil conditions, the terrain, the climatic conditions, the labour, power, material and equipment availability and transport and communications facilities, the availability and transport suitability or borrow areas, the availability of land for right of way and temporary office and accommodations, quarters, and all other facts and facilities necessary or relevant for the formulation of the tender, supply of materials and the performance of the work. Without prejudice to the foregoing, the tenderers may be allowed access to any information regarding the site of the work, the investigations conducted relative thereto, such as soil investigation etc. But, these shall be only indicative in nature and the tenderers are expected to collect their own data for preparation and submission of their tender. Any claim at a later date based on either incorrectness or inadequacy of the information/data made available by the OWNER/consultant to a tenderer shall not be entertained. The OWNER/consultant shall be fully absolved of any and all liabilities in this regard.

10.4 In case the OWNER/consultant decides to have a pre-bid conference to clarify any issues, necessary intimation with adequate notice will be sent to the intending tenderers. Brief summary of the queries raised by the attending tenderers and the clarifications given by the OWNER

/consultant respect thereof, as well as any further information which the OWNER/consultant choose to furnish to the tenderers, in the form of Minutes of the





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Meeting or Addendum, which shall form a part of the Tender Documents, unless otherwise specified.

- 10.5 All communication from the OWNER/consultant to the tenderers shall be sent by speed post/ courier as may be applicable. The tenderers must acknowledge each and every communication sent by the OWNER/consultant the duplicate copy or the Xerox copy of the said communication duly signed by the Tender(s) in token of receipt. Wherever feasible, communications may be sent by Fax/E-mail also followed by confirmatory copies by post.
- 10.6 The OWNER/consultant may, at his discretion, call for technical/commercial clarification or any other clarifications required, from any Tenderer(s), in respect of his/their tender(s).
- 10.7 The OWNER reserves the right to consider/evaluate only substantially responsive tenders. A substantially responsive tender is one, which, in the opinion of the OWNER (which shall be final and binding on the Tenderer(s)), substantially conforms to all the terms, conditions, specifications and requirements of the Tender Document without material deviations or reservations in respect of any of the following:
- a) scope, quality or performance of the work;
  - b) OWNER's rights or the tenderer's obligations under the contract as per the tender documentation;
  - c) Such deviations the correction of which would affect the competitive position of the other tenderers, who have submitted substantially responsive bids;
  - d) Any tender unaccompanied by the earnest money in a form which is not acceptable as per the Tender Documents, falling short of the requirement of the Tender Document, shall be liable for rejection.
- 10.8 Bidders are expected to bid strictly on the format and subject to the terms and conditions specified in the Tender Documents. Any bid containing any deviation which in the sole opinion of the OWNER is material, or which in the opinion of the OWNER cannot be evaluated so as to place other bidders at a disadvantage, shall be liable to have his/its/their bid rejected.
- 10.9 In case any bidder/tenderer considers it inevitable or unavoidable to make certain deviations from requirements and stipulations of the Tender Document, such bidder/tenderer shall bring out the same separately and prominently in a separate statement enclosed with the tender (or techno-commercial part of the tender in case of two part tenders) so as to make it prominently noticeable by the authority opening the tender. Such a statement should clearly indicate the particular page number, clause, or section of the Tender Document deviated from, the scope and extent of the deviations and explanation as to why the said deviation is considered inevitable or unavoidable in the view of the tenderer.
- 11.0 Collusive or Fraudulent tenders
- 11.1 In case it appears to the OWNER, after examining the tenders received, that any 2 (two) or more tenders are collusive or otherwise manipulated to the disadvantage of the OWNER and against the spirit of ethical competition, the OWNER reserves the right to summarily reject such tenders. It shall not be incumbent on the OWNER to prove any



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collusion or other malpractice in this regard.

## 12.0 Signing of the Contract

- 12.1 The successful tenderers shall be required to execute a formal contract in accordance with the Form of Contract within 10 (ten) days from the date of receipt of Letter of Acceptance from the OWNER, or such extended time as may be permitted by the OWNER for the purpose to do so.

For and on behalf of  
Mangalore Refinery and Petrochemicals Limited, Mangaluru

## PROFORMA OF DECLARATION OF BLACK LISTING/HOLIDAY LISTING

### In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s. \_\_\_\_\_ which is submitting the accompanying Bid/Tender nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a Managing Partner have been placed on black list or holiday list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof

state “NIL”) In the case of a Partnership Firm:



We hereby declare that neither we, M/s. \_\_\_\_\_, submitting the accompanying Bid/Tender nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern have or has been placed on blacklist or holiday list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof

state “NIL”) In the case of company:

**Tender no:320000590**

**Bidder's Seal & Signature**

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We hereby declare that we have not been placed on any holiday list or black list declared by Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry (presently the Ministry of Petroleum & Natural Gas), except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state “NIL”)



It is understood that if this declaration is found to be false in any particular, Mangalore Refinery and Petrochemicals Limited or its Administrative Ministry, shall have the right to reject my/our bid, and if the bid has resulted in a contract, the contract is liable to be terminated.

Signature of Bidder \_\_\_\_\_

Name of Signatory: \_\_\_\_\_

Place:

Date:

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### EQUIPMENT QUESTIONNAIRE



(To be furnished with the Tender)

The tenderer shall specify in the form given below the list of equipment owned by the tenderer, which shall be used for the work if awarded to the tenderer.

Type	Number	Make	Capacity	Location	Owner
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Signature \_\_\_\_\_ of  
Tenderer Name and Address  
of The Tenderer



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### FORM OF TENDER

(To be filled up by the Tenderer)

#### For Price Bid

Serial No.

Date:

From

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To

Mangalore Refinery and Petrochemicals Limited  
Mangalore

Tender No. \_\_\_\_\_



Having examined the Tender Documents consisting of the Notice inviting Tender, General Instruction of Tenderer, General Conditions of Contract, Special Instructions to Tenderers, Special Conditions of Contract, specifications, plans, drawings, time-schedule, form of Contract, form of tender, form of Schedule of Rates and Addendum (s) to Bidding Document having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of Mangalore Refinery And Petrochemicals Ltd., relating to the work tendered for in connection with the construction of

..... (Name of Refinery/ Project , Mangalore”, and having conducted a thorough study of the job site(s) involved, the site conditions, soil conditions, the climatic conditions, labour, power, water, material and equipment availability, the transport and communication facility, the availability and suitability of borrow areas, the availability of land for right-of-way and temporary office and accommodation quarters and all other factors and facilities and things whatsoever necessary or relative to the formulation of the tender and the performance of work. I/We hereby submit our tender offer for the performance of the proposed work in accordance with the terms and conditions and within the time mentioned in the Tender Documents at the rate(s) quoted by me/us in the accompanying schedules of rates based on the form of schedule (s) of Rates included within the Tender documents and arrived at a Total Contract Value of **(as quoted in E-tendering Portal)**

based on an application of the rates tendered in the accompanying Schedule(s) of Rates to the relative quantities indicated in the form of Schedule (s) of Rates forming part of the Tender Documents.

**Tender no:320000590**

**Bidder's Seal & Signature**

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If the work or any part thereof is awarded to me/us, I/We undertake to perform the work in accordance with the contract document as defined in Form of contract forming part of the Tender Documents and accept the terms and conditions of Contract as laid down therein, and undertake within 10 (ten) days of receipt of Acceptance / Award of Tender to pay to and/or deposit with the Accounts Officer, Mangalore Refinery And Petrochemicals Ltd., Mangalore, a sum which, together with the amount of Earnest Money deposited by me/us in terms hereof, shall make Rupees ...../- (Rupees.....) as specified in the Acceptance / Award of Tender for the purpose of security deposit, by any one or more of the modes of payments specified in the general conditions of contract, and to commence work at each

job site(s) involved within 10 (ten) days of handing over the job site or any part thereof to me/us, and to sign, the formal contract in terms of the form of contract forming part of Tender Documents, within 10 (ten) days of receipt of Letter of Acceptance / Award from or on behalf of Mangalore Refinery And Petrochemicals Ltd., in this behalf failing which Mangalore Refinery and Petrochemicals Ltd., shall be at liberty, without further reference to me/us and without prejudice to any of its rights or remedies, to terminate the contract and/or to forfeit the Earnest Money deposited in terms hereof.

In consideration of the sum of Rupee 1/- (Rupee one only) paid to me/us by Mangalore Refinery And Petrochemicals Ltd., by adjustment in the price of Tender Documents, I/We further undertake to keep my/our this tender offer open for a period of not less than 4/6 (four/six) months from the Schedule date of opening of Tender as specified in the General Instructions to tenderers forming part of the Tender Documents.

I/We hereby further state that I/We/None of us (in the case of partnership firm) was/were employed as Directors of Mangalore Refinery And Petrochemicals Ltd., during the period of 2 (two) years immediately preceding the date hereof or I/We hereby declare that I/Sri ., one of

our partners in the case of a partnership firm, was employed as a Director in the Mangalore Refinery And Petrochemicals Ltd. during the period of 2 (two) years immediately preceding the date hereof and that I/Sri..... have/has obtained previous permission of Mangalore Refinery And Petrochemicals Ltd., to participate in this tender.

I/We have annexed to this tender the following documents:

- (xi) Schedule of Rates in the prescribed form:
- (xii) Original Power of Attorney or proof of authority of the person who has signed the Tender OR copy of Power of Attorney or duly attested by a Gazetted Officer in proof of authority of the person who has signed the tender;
- (xiii) Original Income-tax Clearance certificate OR copy of Income-tax Clearance Certificate duly attested by a Gazetted Officer;
- (xiv) Original Sales Tax Clearance Certificate OR copy of Sales-tax Clearance Certificate duly attested by a Gazetted Officer;



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- (xv) Information regarding tenderer in the form annexed to the Form of Tender;
- (xvi) Information regarding experience of work of a comparable nature in the form annexed to Form of Tender:
- (xvii) Information regarding construction organization and equipment in for form annexed to the Form of Tender;
- (xviii) Solvency Certificate from a Nationalized/Scheduled Bank:
- (xix) Set of Tender Documents, as issued duly signed;
- (xx) Any additional documents as listed below;

I/We hereby undertake that the statements made herein and the information given in the Annexures referred to above are true in all respects and that in the event of any such statement or information

being found to be incorrect in any particular, the same may be construed to be misrepresentation entitling Mangalore Refinery And Petrochemicals Ltd.to avoid any resultant contract.

I/We further undertake as and when called upon by Mangalore Refinery And Petrochemicals Ltd., to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

I/We confirm having deposited Earnest Money of Rs.....  
(Rupees.....) as detailed hereunder: (strike-off whichever is not applicable.)

By Demand Draft No..... Dated..... Drawn.....  
Bank..... Branch..... attached hereto)

Dated this ..... day of ..... 200.



Yours faithfully,

Signature(s) of the Tenderer (s)

Witness (Signature)

**Tender no:320000590**

**Bidder's Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

Name in block letters

Address

Occupation

:

Name and designation of authorised person signing the tender on behalf of the tender (s). Full name and address of the tenderer(s).

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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**FORM OF TENDER**

(To be filled up by the Tenderer)

**For Commercial Bid**

Serial No.

Date:

From

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

To

Mangalore Refinery and Petrochemicals Limited  
 Mangalore

Tender No. \_\_\_\_\_

Dear Sirs,

Having examined the Tender Documents consisting of the Tender Notice, General Instructions to Tenderers, General Conditions of Contract, Special Instructions to Tenderers, Special conditions of Contract, Specifications, Plans (Exhibits \_\_\_\_\_ to \_\_\_\_\_), Drawings (Exhibits \_\_\_\_\_ to \_\_\_\_\_) Time Schedule, Form of Contract, Form of Schedule of rates, and Addendum (a) to the Tender Documents, and having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of Mangalore Refinery and Petrochemicals



Limited, relative to the work tendered for in connection with the \_\_\_\_ (Name of the Refinery/Project) and having conducted a thorough study of the job site(s) involved, the site conditions, soil conditions, the climatic conditions, labour, power, water, material and equipment availability, the transport and communication facilities, the availability and suitability of borrow areas, the availability of land for right of way and temporary office accommodation and quarters and all other facilities and things whatsoever necessary for or relative to the formulation of the tender of the performance of work, I/we hereby submit my/our tender offer for the performance of proposed work in accordance with the terms and conditions and within the time mentioned in the Tender Documents.

In consideration of the sum of Rupee 1/- (Rupee one) only paid to me/us by Mangalore Refinery and Petrochemicals Limited, by adjustment in the price of Tender Documents, I We further undertake to keep my/our this tender offer open for a period of not less than 4 (four) months from the schedule date of opening of Tenders as specified in the General Instructions to Tenderer forming part of the Tender Documents:

I/ We hereby further state that I/We/None of us (in the case of partnership firm) and none of our Directors (in the case of a Company) was/were employed as Directors of Mangalore Refinery and Petrochemicals Limited, during the period of 2(two) years immediately preceding

**Tender no:320000590**

**Bidder's Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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the date hereof OR I/We hereby declare that I/Shri\_\_\_one of our partners (in case of partnership firm/Directors in the case of a company) was employed as a Director in Mangalore Refinery and Petrochemicals Limited, during the period of 2 (two) years immediately preceding the date hereof and that I/Shri \_\_\_\_\_have/has obtained previous permission of Mangalore Refinery and Petrochemicals Limited, to make this tender .

I/We have annexed to this Bid the following documents:



- (i) Schedule of Rates in the prescribed form - mention QUOTED for all line items in FORM SP-0.
- (ii) Preamble to Price schedule
- (iii) Schedule of Rates in the pre-filled FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4.
- (iv) Original Power of Attorney or other proof of authority of the person who has signed the Tender OR copy of Power of Attorney attested by a Gazetted Officer or a Notary Public in proof of authority of the person who has signed the Tender.
- (v) Original Income-tax clearance certificate OR copy of Income-Tax Clearance certificate duly attested by Gazetted Officer/Notary Public.
- (vi) Information regarding tenderer in the form annexed to the Form of Tender.
- (vii) Information regarding experience of the tenderer in the performance of work of a comparable nature in the form annexed to the Form of Tender.
- (viii) Information regarding construction organization and equipment in the form annexed to the Form of Tender.
- (ix) Solvency Certificate from a Nationalized/Scheduled bank.
- (x) Set of Tender Documents, as issued duly signed.
- (xi) Additional Documents as listed below.

I/We hereby undertake that the statements made herein/information given in the Annexures referred to above are true in all respects and that in the event of any such statement or information being found to be incorrect in any particular, the same may be construed to be a misrepresentation entitling Mangalore Refinery and Petrochemicals Limited, to avoid any resultant contract.

I/We further undertake as and when called upon by Mangalore Refinery and Petrochemicals Limited to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

I/We confirm having deposited earnest Money of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) as detailed hereunder (Strike off whichever is not applicable).

Witness: Signature Name: Occupation:

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

Witness:

(Signature(s) of the Tenderer(s))

Signature



Name:

Occupation

:

Name & Designation of Authorized person Signing the Tender on behalf of The Tenderer(s) Full Name and address of the Bidder(s)



Name & Designation of Authorized person Signing the Tender on behalf of The Tenderer(s) Full Name and address of the Bidder(s)

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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**INFORMATION ABOUT TENDERER**  
(To be furnished with Tender)

1. In case of Individual
  - 1.10 Name of Business:
  - 1.11 Whether his business is registered:
  - 1.12 Date of Commencement of business:
  - 1.13 Whether he pays Income Tax over Rs.10,000/- per year:
  - 1.14 Whether he is a Director or is related to any Director of MRPL present or retired within the past 2 years.
  - 1.15 Permanent Account Number:
  - 1.16 What are his profits/losses for the past 3 (three) years with a copy of Balance Sheet and Profit & Loss Account for the past 3 (three) years with a copy of the audited balance Sheets and Profit & Loss account for the past 3 (three) years:
  - 1.17 What are his concurrent job commitments:
  - 1.18 How does he propose to finance the work if awarded to him:
  
2. In case of Partnership
  - 2.10 Name of Partners:
  - 2.11 Whether the partnership is registered:
  - 2.12 Date of establishment of firm:
  - 2.13 If each of the partner of the firm pays Income tax over rs.10,000/- a year and if not, which of them pays the same:
  - 2.14 Whether any partner of the firm is a Director of MRPL present or retired within the past 2 years.
  - 2.15 Permanent Account Number:
  - 2.16 What are the firm's profits/losses for the past 3 (three) years with a copy of Balance Sheet and Profit & Loss Account for the past 3 (three) years:
  - 2.17 What are the firm's concurrent job commitments:
  - 2.18 How does the firm propose to finance the work if awarded to him:
  
3. In case of Limited Company or Company Limited by Guarantees:
  - 3.10 Amount of paid up capital:
  - 3.11 Name of Directors:
  - 3.12 Date of registration of Company:
  - 3.13 Copies of the Balance Sheet of the company of the last two years:
  - 3.14 Whether any of the Directors of the Company is a Director or is related to any Director of MRPL present or retired within the past 2 years.
  - 3.15 Permanent Account Number:
  - 3.16 What are the Company's profits/losses for the past 3 (three) years with a copy of the audited Balance Sheet for the past 3 (three) years
  - 3.17 What are the company's concurrent job commitments:
  - 3.18 How does the Company propose to finance the work if awarded to it:



	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

NOTE: Reference is also invited to Clause 9.0 of General Instruction to the Tenderers forming part of GCC.

Signature \_\_\_\_\_ of  
Tenderer Name & Address of  
the Tenderer

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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## FORM OF CONTRACT

(To be executed on a Non Judicial Stamp Paper of appropriate value)

THIS CONTRACT made at Mangalore this ..... day of .....20..... BETWEEN MANGALORE REFINERY AND PETROCHEMICALS LIMITED, registered in India under the Indian Companies Act, 1956, having its Registered Office at

..... (Hereinafter referred to as the "Owner which expression shall include its successors and assigns) of the One part AND \*.....

.....\* carrying on business in sole proprietorship /\*carrying on business in partnership under the name and style of

...../\*..... a Company registered in India under the Indian Companies Act \* 1913/1956, having its Registered Office at .....(hereinafter referred to as the "Contractor" which expression shall include \*his/\*their\* its executors, administrator, representatives and permitted assigns /

\*successors and permitted assigns) of the other part:

### WHEREAS

The Owner desires to get executed certain work more specifically mentioned and described in the contract documents (hereinafter called the "work" which expression shall include all amendments therein and/or modifications thereof) and has accepted the tender of the Contractor for the said work::

NOW, THEREFORE, THIS CONTRACT WITNESSETH as follows:

### ARTICLE - 1

#### CONTRACT

#### DOCUMENTS

- 1.1 The following documents shall constitute the contract documents, namely :
- (a) This form of contract duly executed.
  - (b) Original tender documents as defined in the instructions to the Bidders.
  - (c) Acceptance Award of Tender
  - (d) Further Amendment(s) /Corrigendum.
- 1.2 A copy each of the Tender Documents annexed hereto and the said copies have been collectively marked Annexure - I while a copy of the Acceptance Award of Tender and Annexures thereto and hereto annexed and marked Annexure II (\*A copy /\* copies of the further Amendment / Amendments arrived at \*is/\*are annexed hereto and\* collectively marked Annexure - III).



**MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE**

**PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL  
REFINERY, MANGALORE, KARNATAKA  
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**ARTICLE - 2**

**WORK TO BE**

**PERFORMED**

- 2.1 The Contractor shall perform the said work upon the terms and conditions and within the time specified in the contract documents.

**ARTICLE - 3**

**COMPENSATION**

- 3.1 Subject to and upon the terms and conditions contained in the contract documents the Owner shall pay Contractor Compensation as specified in the Contract document upon the satisfactory performance of the said work and or otherwise as specified in the contract document.

**ARTICLE- 4**

**JURISDICTION**

- 4.1 Notwithstanding any other court or courts having jurisdiction to decide the question conforming the subject matter of the reference if the same had been a subject matter of a suit and all actions and proceedings arising out of or relative to the contract (including any Arbitration in terms thereof) shall lie only in the Court of empowered civil jurisdiction in this behalf at Mangalore, Karnataka) and only the said court shall have jurisdiction to entertain and try any such action(s) and/or proceedings to the exclusion of all other courts.

**ARTICLE- 5**

**ENTIRE**

**CONTRACT**

- 5.1 The Contract document mentioned in Article - I hereof embody the entire contract between the parties hereto, and the parties declare that in entering this contract they do not rely upon any previous representation whether expressed or implied and whether written or oral or any inducement, understanding or agreement of any kind not included within the contract document and all prior negotiations, representation, contracts, and/or Agreements and understandings are hereby canceled.

**ARTICLE-6**



**MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE**

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**NOTICES**

- 6.1 Subject to any provisions in the contract documents, any notice, order or communication sought to be served by the Contractor on the Owner with reference to the contract shall be deemed to have been sufficiently served upon the Owner (notwithstanding any enabling provisions under any law to the contrary) only if delivered by hand or by Registered Post Acknowledgement Due to the Engineer-In- Charge as defined in the General Conditions of Contract.
- 6.2 Without prejudice to any other mode of service provided for in the contract document or otherwise available to the Owner, any notice, order or other communication sought to be served by the Owner or on the Contractor with reference to the contract, shall be deemed to have been sufficiently served if delivered by hand or through Registered Post Acknowledgement Due to the principal office of the Contractor at .....

**ARTICLE - 7**

**WAIVER**

- 7.1 No failure or delay by the Owner in enforcing any right or remedy of the Owner in terms of contract of any obligation or liability of the Contractor in terms thereof shall be deemed to be a waiver of such right, remedy, obligation or liability, as the case may be, by the Owner and notwithstanding such failure or delay, the Owner shall be entitled at any time to enforce such right, remedy, obligation or liability, as the case may be.

**ARTICLE - 8**

**NON - ASSIGNABILITTY**

- 8.1 The contract and benefits and thereof shall be strictly personal to the Contractor and shall not on any account be assignable or transferable by the Contractor.

**ARTICLE - 9**

**LANGUAGE OF CONTRACT AND COMMUNICATION**

- 9.1 The language of the Contract shall be English and all communications, drawings, design, data, information codes specifications and other document whatsoever supporting the bid or otherwise exchanged under the Contract shall be in English. In the event that any technical documentation is in any language other than English, the document should be translated and presented to the OWNER/Engineer-in-Charge in English and English document/translated document shall be regarded as the only authentic document.


**MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE**
**PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL  
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**ARTICLE 10**
**GOVERNMENT OF INDIA**
**NOT LIABLE**

- 10.1 It is expressly understood and agreed by and between the CONTRACTOR and the OWNER that the OWNER is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights there under. It is expressly understood and agreed that the OWNER is a independent legal entity with power and authority to enter into contracts, solely in its behalf under the applicable laws of India and general principles of Contract Law. The CONTRACTOR expressly agrees, acknowledges and understands that the OWNER is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Contract. Accordingly, CONTRACTOR hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Government of India arising out of this Contract and covenants not to sue the Government of India on any matter, claim, cause or action or thing whatsoever arising out of or under this Contract.

**ARTICLE 11**
**NO LIABILITY ON DIRECTOR AND EMPLOYEE**



- 11.1 No Director, employee, consultant or agent of the OWNER or other person representing the OWNER or acting on behalf of the OWNER in or pursuant to the Contract or in the discharge of any obligation to the OWNER under the Contract or otherwise in relation to the Contract shall have any personal liability to the CONTRACTOR or any Sub-Contractor, agent, representative, director or employee of the CONTRACTOR or to any other person acting for or on behalf of the CONTRACTOR and the CONTRACTOR on its own behalf and on behalf of the Sub-Contractors, directors, employees, agents and representatives hereby waives and disclaims any and all right of action which it or they may have whether undertort or Contract or otherwise against the OWNER or any director, employee, agent, consultant or representative of the OWNER for act of omission or commission done or omitted to be done.

SIGNED AND DELIVERED

For and on behalf of  
Mangalore Refinery and Petrochemicals Ltd.,

Tender no:320000590

Bidder's Seal & Signature

	<p style="text-align: center;"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <hr/> <p style="text-align: center;"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	
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By

In the presence of

- 1.
- 2.

**SIGNED AND DELIVERED**

For and on behalf of

(Contractor)

By

(this day of                      202     )

in the presence of

- 1.
- 2.



	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

### PROFORMA OF BANK GUARANTEE FOR SECURITY DEPOSIT/PERFORMANCE BOND

The irrevocable Bank Guarantee (BG) in the following prescribed format if submitted against Earnest Money Deposit/PBG/SD/Mobilisation advance shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s ‘Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925 **SWIFT Code:** UBININBBMAP **MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

(To be executed ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

Ref: \_\_\_\_\_ Bank Guarantee No.....  
Date.....

To:



M/s. Mangalore Refinery And Petrochemicals  
Ltd., Regd. Office: Kuthethur P.O  
Katipalla, Mangalore 575 030

Dear Sir,

1. In consideration of Mangalore Refinery And Petrochemicals Ltd., having its Registered Office at..... (hereinafter referred to as the “Company” which expression shall unless repugnant to the context or meaning thereof, include all its successors, administrators, executors) and having entered into a contract dated

**Tender no:320000590**

**Bidder’s Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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..... (hereinafter called the “Contract” which expression shall include all the amendments thereto) with M/s. .... having its Head/Registered Office at.....(hereinafter referred to as the “Contractor” (which expression unless repugnant to the context or meaning thereof, shall include all its successors, administrators, executors and assigns) and the contract having been unequivocally accepted by the Contractor resulting in a contract bearing No..... dated..... Valued at for ..... (scope of work) ..... and the Company having agreed that the Contractor shall furnish to

the Company a performance guarantee for the faithful performance of the entire contract to

the extent of ..... % of the contract price, i.e. Rs..... (in word) we

..... (bank)..... having its Registered Office at.....

.....(hereinafter referred to as the “Bank” which expression shall

unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay on demand to the Company any money or all moneys to the extent of Rs..... (Rupees .....) in aggregate at any time without any demur, reservation, recourse, contest or protest and/or without any reference to the Contractor. Any such demand made, by the Company on the Bank shall be conclusive and binding notwithstanding any difference between the Company and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that Guarantee herein contained shall be irrevocable and shall continue to be enforceable till it is discharged by the Company in writing.

2. The Company shall have the fullest liberty, without affecting in any way the liability of the Bank under this Guarantee from time to time, to extend the time for performance of the contract by the Contractor, or vary the terms of the Contract. The Company shall have the fullest liberty without affecting this Guarantee to postpone, from time to time, the exercise of power vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce, or to forbear from enforcing, any covenants contained or implied in the contract between the Company and the Contractor or any other course or remedy or security available to the Company. The Bank shall not be released of its obligations under these presents by any exercise by the Company of its liberty with reference to matters aforesaid or any of them or by reason of any other act or forbearance or other act or forbearance of other acts of Company or any other indulgence shown by the Company or by any other matter or thing whatsoever, which under law would, but for this provision, have the effect of relieving the Bank.
3. The Bank also agrees that the Company at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance, without proceeding against the Contractor and notwithstanding any security or other guarantee that Company may have in relation to the Contractor’s liabilities.

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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4. The Bank further agrees that the guarantee herein contained shall remain in full force during the period that is taken for the performance of the contract and it shall continue to be enforceable till all the dues of the Company under or by virtue of this contract have been fully paid and claim satisfied or discharged or till the Company discharges the Guarantee in writing.
5. We further agree that as between us and Company for the purpose of this Guarantee any notice given to us by the Company and any amount claimed in such notice by the Company that the money is payable by the Contractor and any amount claimed in such notice by the Company shall be conclusive and binding on us notwithstanding any difference between the Company and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We further agree that this Guarantee shall not be affected by any change in our Constitution or that of the Contractor or in the Constitution of the Company. We also undertake not to revoke this Guarantee during its currency.
6. Notwithstanding anything contained hereinabove, our liability under this Guarantee is limited to Rs..... (Rupees .....) in aggregate and it shall remain in full force upto and including sixty days after ..... unless extended further, from time to time, for such period as may be instructed in writing by M/S..... on whose behalf this Guarantee has been given, in which case it shall remain in full force upto and including 60 days after extended date. Any claim under this Guarantee must be received by us before the expiry of the 90 days from ..... or before the expiry of the 90 days from the extended date. If no such claim has been received by us within the sixty days after the said date/extended date, the Company's right under this guarantee will cease. However, if such a claim has been received by us within and upto ninety days after the said date/extended date, all the Company's rights under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

The bank doth hereby that Shri ..... ( designation ) ..... Who is authorized this Guarantee / Undertaking on behalf of the bank and to bind the bank thereby Dated this ..... Day of .....200....

WITNESS:

\_\_\_\_\_

(SIGNATURE)

\_\_\_\_\_

(NAME)

\_\_\_\_\_

(OFFICIALADDRESS)

\_\_\_\_\_

(SIGNATURE)

\_\_\_\_\_

(NAME)

\_\_\_\_\_



(Designation with Bank Stamp)



\_\_\_\_\_ Attorney as per power of Attorney No.....

Dated:.....

Tender no:320000590

Bidder's Seal & Signature

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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### PROFORMA OF BANK GUARANTEE

The irrevocable Bank Guarantee (BG) in the following prescribed format if submitted against Earnest Money Deposit/PBG/SD/Mobilisation advance shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925 **SWIFT Code:** UBININBBMAP **MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

(FOR EARNEST MONEY DEPOSIT AS APPLICABLE)  
(On non-judicial paper of appropriate value)



To  
Mangalore Refinery and Petrochemicals  
Limited Mangalore

Dear Sirs,

In consideration of Mangalore Refinery and Petrochemicals Limited , having its Registered Office at Kuthethoor P.O Via Katipalla , Mangalore - (hereinafter called “the Owner” which expression shall include its successors and assigns), having agreed interalia to consider the tender of  
..... (Name of the Tenderer) having its Head Office/Registered

**Tender no:320000590**

**Bidder’s Seal & Signature**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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Office at

..... (Address of the Tenderer) (hereinafter called the “Tenderer” which expression shall include its successors and assigns), for the work of ..... (Name of the

Project/ Work) at..... to be awarded under Tender No..... Upon the Tenderer furnishing an undertaking from the Bank as hereinafter appearing in lieu of cash deposit of the Earnest Money.

We ..... (Name of the Bank), a Bank Constituted/Registered under the ..... Act, having our Head Office/Registered Office at ..... (hereinafter called the “Bank” which expression shall include its successors and assigns), at the request of the Tenderer and with the intent to bind the Bank and its successors and assigns do hereby unconditionally and irrevocably undertake to pay the Owner at Mangalore forthwith on first demand without protest or demur or proof or satisfaction or condition and without reference to the Tenderer, all sums payable by the Tenderer as and by way of Earnest Money to the Owner, upto an aggregate limit of (Amount in figures and words).

**AND THE BANK DOTH HEREBY FURTHER AGREES AS FOLLOWS:**

1 This Guarantee/Undertaking shall be a continuing guarantee and shall remain in full force and effect for all claims or demands made by the Owner on the Bank until the Owner discharges this Guarantee/Undertaking subject, however, that the Owner shall have no claims under this Guarantee/Undertaking after the midnight of .....200..... or any written extension(s) thereof.

PROVIDED that if the aforesaid work tendered for or any part thereof shall be awarded to the Tenderer on or before the said date, whether on the basis of accompanying tender or any other basis, then the validity of this guarantee/undertaking shall stand automatically extended for all claims and demands made by the Owner for further three months.

2 The Owner shall have the fullest liberty without reference to the Bank and without affecting in any way the liability of the Bank under this Guarantee/Undertaking at any time and/or from time to time any wise to postpone and/or vary any of the powers, rights, and obligations exercisable by the Owner against the Tenderer and either to enforce or to forbear from enforcing all or any of the terms and conditions of or governing the said Tender and/or any contract consequent upon any award of work or the said Earnest Money Deposit or the securities available to the Owner or any of them and the Bank shall not be released from its liability under these Presents and the Liability of the Bank hereunder shall remain in full force and effect notwithstanding any exercise by the Owner of the liberty with reference to any or all the matters aforesaid or by reason of any other act, matter or thing whatsoever which under law relating to the sureties or otherwise which could, but for this provision have the effect of releasing the Bank from all or any of its obligations hereunder or any part thereof, and the Bank specifically waives any and all contrary rights whatsoever.

**Tender no:320000590**

**Bidder’s Seal & Signature**





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- 3 It shall not be necessary for the Owner to proceed against the Tenderer before proceeding against the Bank and the Guarantee/Undertaking herein contained shall be enforceable against the Bank as principal debtor notwithstanding the existence of any other undertaking or security for any indebtedness of the Tenderer to the Owner and notwithstanding that any such security shall at the time when claim is made against the Bank or proceedings taken against the Bank hereunder, be outstanding or unrealised.
- 4 The amount stated by the Owner in any demand, claim or notice made with reference to this guarantee shall as between the Bank and the Owner for the purpose of these Presents be conclusive of the amount payable by the Bank to the Owner hereunder.
- 5 The liability of the Bank to the Owner under this Guarantee/Undertaking shall remain in full force and effect notwithstanding the existence of any difference or dispute between the Tenderer and the Owner, the Tenderer and the Bank and/or the Bank and the Owner or otherwise howsoever touching these Presents or the liability of the Tenderer to the Owner, and notwithstanding the existence of any instructions or purported instructions by the Tenderer or any other person to the Bank not to pay or for any cause withhold or defer payment to the Owner under these Presents, with the intent that notwithstanding the existing of such difference, dispute or instructions, the Bank shall be and remain liable to make payment to the Owner in terms thereof.
- 6 This Guarantee/Undertaking shall not be determined or affected by the liquidation or winding up or dissolution or change of constitution or insolvency of the Tenderer or any change in the legal constitution of the Bank or the Owner.
- 7 Without prejudice to any other mode of service, a demand or claim or other communication may be transmitted by the Owner to the Bank either by post or by fax. If transmitted by fax, the transmission shall be complete as soon as acknowledged by the Bank.
- 8 Notwithstanding anything contained herein:
- i) The Bank's liability under this guarantee/undertaking shall not exceed (Amount in figures & words);
  - ii) The guarantee/undertaking shall remain in force upto \_\_\_\_\_ and any extension(s) thereof; and
  - iii) The Bank shall be released and discharged from all liability under this guarantee/undertaking unless a written claim or demand is issued to the Bank on or before \_\_\_\_\_ or the date of expiry of any extension(s) thereof if this guarantee/undertaking has been extended.

The Bank doth hereby declare that Shri \_\_\_\_\_ (designation) \_\_\_\_\_ who is authorised to sign this Guarantee/Undertaking on behalf of the Bank and to bind the Bank

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**Bidder's Seal & Signature**

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thereby.

This \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_.

Yours faithfully

Signature: \_\_\_\_\_

Name &

Designation: \_\_\_\_\_

Name of the

Branch: \_\_\_\_\_

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### GUARANTEE AGAINST ADVANCE PAYMENT

The irrevocable Bank Guarantee (BG) in the following prescribed format if submitted against Earnest Money Deposit/PBG/SD/Mobilisation advance shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:

**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925 **SWIFT Code:** UBININBBMAP **MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

(To be executed on non-judicial stamp paper of appropriate value)

This deed of Guarantee made this .....day of between \_\_\_\_\_ and  
 wherever the context so required includes \_\_\_\_\_ its successors  
 and assigns hereinafter  
 called ‘The \_\_\_\_\_ surety’



and

.....“ a company registered under the Companies Act of 1956 and having  
 its Registered Office at ..... and wherever  
 the context so required includes its successors and assigns, hereinafter called ‘The Owner’.

Whereas M/s..... a Company registered under  
 the Companies Act of 1956 having at its registered office at  
 ..... (wherever applicable) and wherever the  
 context so requires includes its successors and assignees, hereinafter called ‘the

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**Bidder’s Seal & Signature**

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Contractor' has undertaken to

..... on the terms and conditions mentioned  
in the

a) Letter of Acceptance / No .....  
Dated.....

OR

b) Agreement No.....  
Dated.....  
Referred to as “ the said Contract”,

And whereas the Owner has agreed to make an advance of Rs.....  
(Rupees.....) being .....% value of the  
contract on ..... as provided in the contract as the said advance to  
the Contractor

AND WHEREAS the Contractor has agreed with the Owner authorizing him to deduct the  
said advance thereon under the terms of the said contract from the amount that  
becomes due and payable to the Contractor as per the terms and conditions described  
under the clause ‘Terms and conditions of Payment’ of the Contract on proper execution  
of the Contract.



Now this deed witnesseth that in consideration of the said advance or any balance  
thereof made by the Owner to the Contractor, the surety hereby GUARANTEES the  
payment of the said advance thereon by the Contractor, and undertakes to pay the  
Owner on demand the sum of Rs..... subject to the following conditions.

- a) “Surety hereby gives an irrevocable guarantee and declares that its liability  
under this bond shall extend to the payment of the whole of amount viz.  
Rs..... paid as advance as provided for in the contract “as the  
said advance”.
- b) This Guarantee shall remain in full force and effect so long as the said advance  
or any part thereof remains outstanding and shall expire and become ineffectual  
only after the recovery of the entire sum of Rs..... covered by the  
guarantee and upon intimation thereof being given by the Owner to the Surety,  
in which event, the Surety shall be discharged by the Owner.
- c) The Surety shall not be discharged or released from the Guarantee by any  
arrangements made between the Owner and the Contractor with or without the  
consent of the Surety or by any alteration in the obligations of the parties or by  
any indulgence, forbearance, whether as to payment, time, performance or  
otherwise. This Guarantee / Undertaking shall not be determined or affected by  
the liquidation or winding up or dissolution or change of constitution or solvency  
of the Tenderer or any change in legal constitution of the Bank or Owner

d) The Guarantee shall come into force from the date Contractor receives from the

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**Bidder's Seal & Signature**

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Owner the said advance i.e, - (specify the date).

- e) Notwithstanding anything stated above, the liability of the Surety under the guarantee is restricted to Rs..... (Rupees .....  
.....) and this guarantee will remain in force upto ..... at the first instance. However, if the contract for which this guarantee is given is not completed or fully performed, the surety (bank) hereby agrees to further extend the Guarantee till such time as is required by the owner to fulfill the contract. The Bank shall be released and discharged from all liability under this guarantee / undertaking unless a written claim or demand is issued to the Bank on or before\_ or the date of expiry of any extension(s) thereof if this guarantee/undertaking has been extended

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Owner the said advance i.e, - (specify the date).

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PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY,  
MANGALORE, KARNATAKA

TENDER NO. 320000590

SPECIAL CONDITIONS OF CONTRACT (SCC)

1. SPECIAL CONDITIONS OF CONTRACT -PART 1
2. SPECIAL CONDITIONS OF CONTRACT - PART 2

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## SPECIAL CONDITIONS OF CONTRACT

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### SPECIAL CONDITIONS OF CONTRACT - PART 1

#### 1.0 INTRODUCTION

- 1.1. These Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract specifications of work, drawings and any other document forming part of this contract wherever the context so requires.
- 1.2. Notwithstanding the sub-division of the document into these separate sections and volumes, every part of each shall be deemed to be supplementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.
- 1.3. The materials, design and workmanship shall satisfy the relevant Indian Standards, the Technical Specifications contained herein and codes referred to. Where the job specifications stipulate requirements in addition to those jobs contained in the standard codes and specifications, these additional requirements shall also be satisfied. In absence of any standards/ specifications/ codes of practice for detailed specifications covering any part of the work covered in this tender, the instructions/ directions of Engineer-in-charge will be binding on the CONTRACTOR.
- 1.4. Where any portion of the GCC is repugnant to or at variance with any provisions of the Special Conditions of Contract, then unless a different intention appears, the provision(s) of the Special Conditions of Contract shall be deemed to override the provision(s) of GCC only to the extent that such repugnancies of variations in the Special Conditions of Contract are not possible of being reconciled with the provisions of GCC.
- 1.5. Without prejudice to the provisions of the General Conditions of Contract, whenever in the Bidding documents it is mentioned or stated that the CONTRACTOR shall perform certain work or provide certain facilities it is understood that the CONTRACTOR shall do so at his own cost and the Contract price shall be deemed to have included cost of such performance and/or provision, as the case may be.
- 1.6. The Engineer-in-charge for this project will be DGM (Projects) and Bill certification Authority will be CGM (Projects).

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- 1.7. In case of an irreconcilable conflict between Indian or other applicable standards, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings and/or Schedule of Rates, the following shall prevail to the extent of such irreconcilable conflict in descending order of precedence:
- i) Formal Contract.
  - ii) Detailed Letter of Acceptance.
  - iii) Fax/ Letter of Acceptance.
  - iv) Schedule of Price / Rates
  - v) Job/Particular Specification.
  - vi) Drawings.
  - vii) Technical/ Material Specifications.
  - viii) Special Conditions of Contract.
  - ix) Special Instructions to Bidders
  - x) General Conditions of Contract
  - xi) Standard Specifications.
  - xii) Indian Standards.
  - xiii) Other applicable Standards.
- 1.8. In case of irreconcilable conflict between any documents, the more stringent will apply in favor of the OWNER. This stipulation overrides Clause 2.0.14.0 of the GCC.
- 1.9. In the absence of any Specifications covering any material, design or work(s) the same shall be performed/supplied/executed in accordance with standard Engineering Practice as per the instructions/directions of the Engineer-in-Charge, which will be binding on the CONTRACTOR.

## **2.0 LIABILITY CLAUSE**

It is expressly understood and agreed by and between Bidder and M/s Mangalore Refinery and Petrochemicals Limited (A Subsidiary of ONGC) that M/s Mangalore Refinery and Petrochemicals Limited is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights hereunder.

It is expressly understood and agreed that M/s Mangalore Refinery and Petrochemicals Limited is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable Laws of India and general principles of Contract Law. The Bidder expressly agrees, acknowledges and understands that M/s Mangalore Refinery and Petrochemicals Limited is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of



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India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly Bidder hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counterclaims against the Government of India arising out of this contract and covenants not to sue Government of India as to any manner, claim, cause of action or thing whatsoever, arising of or under this agreement

### 3.0 LABOUR LICENSE/ LABOUR LAWS AND REGULATIONS

3.1 Before starting of work, the CONTRACTOR shall obtain a license from the concerned authorities under the Contract Labour (Abolition and Regulation) Act, 1970 and shall furnish copy of the same to OWNER.

The labour license for the appropriate labour shall be valid for the total contractual period including extended period, if any.

3.2 **LABOUR LAWS AND REGULATIONS** Labour laws and regulations as mentioned in GCC Clause No. 8.3.0.0 are applicable.

However the following are added to the mentioned clause:

- i. Contractors and their Sub-Contractors shall carry out all payments to their workforce through their individual bank accounts only. The records of such bank transfer shall be submitted as proof of compliance along with the wage registers. Wage registers without these statements will not be accepted.
- ii. Details of bank accounts of the individual workmen shall be submitted for issuance of gate pass. Contractors and their sub-contractors shall ensure that minimum wages as notified from time to time are paid and the wage register and transfers shall be verified on the basis of such minimum wages.
- iii. Group term Life insurance cover to be taken having a risk coverage 24X7 death coverage (Natural / Accidental death) with a sum assured of say Rs. 10,00,000/- (Rs.Ten lakh ) by the contractor.
- iv. The details of documents to be submitted to HR Department by the Contractor duly signed by Engineer- In-charge as per **clause 20.0** of this SCC COMMERCIAL.
- v. The Contractor shall obtain necessary license from the Licensing Authority under the Contract Labour (Regulation & Abolition) Act, 1970 and the Central Rules framed there under and produce the same to the Engineer-in-charge before start of work.
- vi. The Contractor shall not undertake or execute or permit any other agency or sub-contractor to undertake or execute any work on the contractor's behalf through contract labour except under and in accordance with the license issued in that behalf by the Licensing Officer or other authority prescribed under the Factories Act or the Contract labour (Regulation & Abolition) Act- 1970 or their applicable law rule or regulation if applicable.
- vii. The provision of EPF & MP Act. 1952 and the Rules/Scheme thereunder shall be applicable to the Contractor and the employees engaged by him for the work. The Contractor shall furnish the code number allotted by the RPFC Authority, to the Engineer-in-Charge before commencing the work.

 <b>ONGC</b> एन.ओ.एन.जी.सी. <b>MRPL</b>	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	 <b>nauvata</b> ENGINEERING CONSULTANTS
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- viii. The Contractor shall be exclusively responsible for any delay in commencing the work on account of delay in obtaining a license under clause v above or in obtaining the code number under Clause vii above and the same shall not constitute a ground for extension of time for any purpose.
- ix. The Contractor shall enforce the provisions of ESI Act and Scheme framed thereunder with regard to all his employees involved in the performance of the Contract and shall deduct employee's contribution from the wages of each of the employees and shall deposit the same together with employer's contribution of such total wages payable to the employees in the appropriate account.

#### **4.0 MANPOWER EMPLOYED BY TENDERER :**

- i. The successful tenderer shall deploy adequate staff of the requisite competence that may be required for meeting the scope of services/work called for. It is hereby specifically agreed that the responsibility for the employment of staff and their salary, wages remuneration, etc. shall be the sole responsibility of the successful tenderer and that MRPL shall not be responsible in any manner directly or indirectly for such employment or expenses so incurred by successful tenderer thereof. Successful tenderer shall give a declaration to this effect. The Contractor has to comply with all Labour related laws/rules in force w.r.t Minimum wages Act, Factories Act, Labour ACT and all other such regulations/amendments made from time to time and in force and maintain all documents as required by Law enforcing Authorities and produce the same as and when called for.
- ii. It is understood and agreed that there is no Employer- Employee relationship between MRPL and the Contractor AND /or Contractor's employees in any way whatsoever and the contractor shall be the 'Employer' within the meaning of different Labour legislations in respect of workmen employed by the Contractor. The Contractor has to carry on their business or occupation as Independent Contractors and this point shall be made clear in writing to all persons engaged by the Contractor before engagement of the person(s). The Contractor shall issue an Employment card in Form XIV as per Contract Labour Regulation and Abolition Act 1970 OR Photo Identity card to each Worker



#### **5.0 LABOUR RELATIONS :**

- i. In case of labour unrest/labour dispute arising out of non-implementation of any law, the responsibility shall solely lie with the contractor and he shall remove/resolve the same satisfactorily at his cost and risk.
- ii. The Contractor shall deploy only duly qualified and competent personnel for carrying out the various jobs as assigned by the Engineer-in-Charge from time to time. The workmen deployment by the contractor should also possess the necessary license etc., if required under any law, rules and regulations.

#### **6.0 PAYMENT TO CONTRACT WORKMEN:**

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Bidder's Seal & Signature

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- i. In case of manpower based Contracts, Contractor shall be responsible to make payment to his workers/ employees in respect of their salaries/ wages through bank cheques/ crediting to bank A/c; the consent of the labour should be obtained before crediting wages to the bank account, the contractor shall pay wages to all his employees on or before 7th of the following month under the supervision of authorised MRPL personnel and a copy of proof of payments to be submitted to MRPL; MRPL may demand such payment of wages under supervision of MRPL, if found necessary. The rates of wages shall be in conformity to the minimum wages act.
- ii. Contractors and their Sub-Contractors shall carry out all payments to their workforce through their individual bank accounts only. The records of such bank transfer shall be submitted as proof of compliance along with the wage registers. Wage registers without these statements will not be accepted. Details of bank accounts of the individual workmen shall be submitted for issuance of gate pass. Contractors and their sub-contractors shall ensure that minimum wages as notified from time to time are paid and the wage register and transfers shall be verified on the basis of such minimum wages.



#### **7.0 VERIFICATION OF CHARACTER AND ANTECEDENTS OF CONTRACTUAL MANPOWER:**

In all contracts involving deployment of contractor's manpower within MRPL premises like Plants and Offices etc. the contractor shall submit the following documents to MRPL prior to start of work:

- a. Undertaking from the contractor that they have scrutinized the previous work history of the person(s) proposed to be deployed by them and character and antecedents of person(s) proposed to be deployed by them is / are impeccable.
- b. Along with the above mentioned undertakings, the contractor will provide certified photocopies of police verification certificate for inspection by the authorised representatives of MRPL. The contractor has to obtain Police Verification Report from the area where the person(s) to be deployed has / have been residing since the last five years. In case the person concerned has not resided at a place for five years at a stretch, Police verification reports should be obtained from that area where the person(s) has / have stayed earlier.
- c. The contractor shall ensure at the time of submitting their final bills to the EIC, that it is accompanied by a NOC from Security Dept., MRPL, for having surrendered all Photo passes and Bio-Metric cards issued by MRPL. If any Pass and Bio-Metric Cards are not surrendered even after the completion of job / contract, the contractors are liable to pay a fine of Rs.200/- for every un-surrendered pass and Rs. 100/- for every Bio- Metric card (These fine amounts are subject to revision by Security Dept., MRPL, from time to time..)
- d. As per the Security Guidelines issued by Ministry of Home Affairs (MHA), Government of India, verification of Character & Antecedents (Police Verification) in respect of all personnel working in Refineries in mandatory. The Contractor shall submit police Verification Report of the workmen employed under them. Submission of Police verification Report to MRPL in compulsory for issue of fresh passes to work in Plant Process Areas and other sensitive jobs in Non-Plant areas of MRPL.

#### **8.0 COMBINED REGISTER UNDER VARIOUS LABOUR LAWS RULES, 2017 :**

As per the Notification issued by Ministry of Labour and Employment vide their gazette  
**Tender no:320000590** **Bidder's Seal & Signature**

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notification no.G.S.R.154 (E) dated 21/02/2017, for ease and for expedient compliance of the requirement of the various labour related laws, a combined registers has to be maintained under certain labour related laws. If the combined register is required for inspection by the concerned inspector appointed under any of the enactments referred in the rules, the concerned persons shall make available the combined registers or provide necessary particulars for the purpose of accessing the information as the case may be.

## 9.0 PROVIDENT FUND

9.1 The CONTRACTOR shall strictly comply with the provisions of Employees Provident Fund Act and register the establishment with the concerned Regional Provident Fund Commissioner before commencing the work. The CONTRACTOR shall deposit “Employees” and “Employers” contributions in the designated account with the designated Authority every month and must submit a certificate in this regard along with their Bill. The CONTRACTOR shall furnish along with each running bill, the challan/ receipt for the payment of provident fund made to the RPF for the preceding month(s).

9.2 In case the Provident Fund Authority’s receipted challan referred to above is not furnished, OWNER shall deduct 5% (five percent) of the payable amount from the CONTRACTOR’S running bill and retain the same as a security for the payment of the Provident Fund. Such retained amounts shall be refunded to the CONTRACTOR only on production of challan/ receipt of the Provident Fund Authority for the period covered by the related deduction

## 10.0 OBSERVATION OF FORMALITIES RELATING TO PF, ESI, REGISTRATIONS :

10.1 It should be confirmed by the successful tenderer that his/their organisation is already registered with the Provident Fund Commissioner and the details may please he furnished to us for MRPL’S records and the reference. MRPL will reserve its right to inspect the records pertaining to Provident Fund rules.



10.2 PF / ESI Code: The Tenderer shall indicate his / their PF Code / ESI Number in their tender.

10.3 Income Tax: The Tenderer shall in all cases indicate his income tax Permanent Account Number.(PAN). Income Tax Permanent Account Number will be required as precondition of release of payment.

Note: The bidder will have to bear all Income Tax Liabilities both corporate & personal tax. Income Tax along with surcharge of Income Tax as applicable at the prevailing rate on the gross amount billed shall be deducted from the Contractor’s bill as per applicable laws.

## 11.0 DETAILS OF MINIMUM PAYMENT TO WORKFORCE EMPLOYED BY CONTRACTOR

The contractor shall pay Minimum as per the following table to the workforce deployed by him under various categories (Unskilled / Semiskilled / Skilled / Highly Skilled) as applicable;

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Sl no	Description	Payment basis			
1	Basic Wages per DAY	As per Minimum wages act issued from time to time by ALC			
2	PF/Admin charges	13.00 % of Basic Wages & MRPL Special Allowance			
3	ESI	3.25 % of Basic Wages, MRPL Special Allowance & Shift allowance (if applicable).			
4	Leave Wages	5 % of Basic Wages (As per ALC)			
5	Bonus	8.33 % of min wages or Rs 7000 /- per annum whichever is higher			
6	Holiday wages	10 days per year			
7	MRPL Special Allowance per day	Unskilled (in Rs)	Semi Skilled (in Rs)	Skilled (in Rs)	Highly skilled (in Rs)
		34	50	70	90

**Note:** Please refer details of the Minimum wages as mentioned in the SCC/Scope of Work (as applicable). The following to be complied:

- a. Shift allowance (if applicable) - Shift allowance @ Rs 25 /- per shift to be provided to Secondary work force coming in rotational shift (i.e., morning, evening and night shifts) working in plant area.
- b. PF/ESI remittance to be ensured on MRPL Special Allowance.
- c. Rates of MRPL special allowance shall be Rs 34, Rs 50, Rs 70 & Rs 90 for Unskilled, Semi-Skilled, Skilled & Highly Skilled Category respectively.
- d. Gratuity to be paid as per the statutory norms based on the government directives.
- e. Number of closed Holidays shall be 10 days per year.
- f. Extended working hours shall be compensated suitably as per statutory provisions.
- g. Group term life Insurance cover to be taken having a risk coverage 24 X 7 death coverage (Natural /Accidental death) with a sum assured of Rs.10,00,000/- (Rs.Ten lacs only).
- h. Statutory provisions if in contradiction will prevail over any Special conditions of the Contract.
- i. Transportation facility in respect of Secondary Workforce for commuting to entry gates of MRPL shall be in the scope of the contractor. However, for internal transport from entry gate to place of work; existing circular vehicles to be utilised.
- j. For ensuring compliance to the above, suitable number of welfare officers to be placed by contractors with respect to all statutory provisions.
- k. Uniform/ Boiler suit-2 sets per year, Helmet, Shoes, Raincoat to be provided to the



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workforce and proof to be submitted

## **12.0 EMPLOYMENT OF LOCAL LABOUR**

- 12.1 The Contractor shall ensure that local labour, skilled and/or unskilled, to the extent available shall be employed in this work. Special preference shall be given to persons and/or dependents of persons whose land has been acquired for the project work. In case of non-availability of suitable labour in any category out of the above persons, labour from outside may employed.
- 12.2 The CONTRACTOR shall not recruit personnel of any category from among those who are already employed by the other agencies working at site but shall make maximum use of local labour available.

## **13.0 INSURANCE:**



Owner shall at its own cost and expense take out from a suitable insurance company and maintain the following insurances, which shall be Erection All risks Insurance (EAR) or Contractors All Risks Insurance (CAR). The OWNER at his own cost has taken an “all risk” type Comprehensive Marine Cum Erection Insurance policy. These policies apply only to insurance risks at site and to no other location. The CONTRACTOR shall be solely liable in the event of his and/or SUBCONTRACTOR’s having caused any loss or damage of any nature arising out of or in connection with the execution of the WORK not covered under those policies and shall indemnify the OWNER and /or his representative in respect of any claim in respect of any such loss or damage. The CONTRACTOR shall make himself fully familiar with the terms of the said policies and take such additional insurance as he may deem necessary at his own cost.

**CONTRACTOR FURNISHED INSURANCE:** as applicable to the Service Insurance Cover for Workmen: The contractor shall obtain adequate Insurance Policy in respect of his workmen to be engaged for the work compulsorily towards compensations as admissible under the Workmen’s Compensation Act 1923, and Rules framed there under upon death/disablement of a worker and the same has to be produced to the concerned in charge of Administration Section before start of the work.

All workers whose salary is more than Rs 21,000/- per month (Prevailing rate as per the act) need not to be covered by ESI. However, contractor to take insurance policy to cover the risk towards temporary disablement and permanent disablement for the workmen. CONTRACTOR shall at his cost and expense take out from a suitable insurance company acceptable to owner and maintain for the entire period until ACCEPTANCE OF WORKS or until such time thereafter as the CONTRACTOR may consider appropriate the following insurances.

- 1) **Workmen's Compensation Insurance (WCI):**This insurance shall confirm to and satisfy all the requirements of the applicable laws and regulations of the country, state territory





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or province having jurisdiction over the CONTRACTOR's employees engaged in the WORKS.

- 2) **Employer's Liability Insurance (ELI):** The insurance shall cover the liability of the CONTRACTOR as employer, for compensation beyond the coverage of the Workmen's Compensation Insurance for bodily injury to or loss of life the CONTRACTOR's employees while engaged in the WORKS.
- 3) **Third Party Liability Insurance (TPL):** This insurance shall cover legal liability for bodily injury to loss of life of and/or damage to and loss of properties of the third person party arising out of the performance by the CONTRACTOR of the works.
- 4) **Automobile Liability Insurance (ALI):** This insurance shall cover all the CONTRACTOR's liabilities in connection with use by the CONTRACTOR for the WORKS of any mobile equipment and automobile and when used which are owned, non-owned hired and otherwise placed under the CONTRACTOR's administration and control, for bodily injury to loss of life of and/or property damage of any person or party.
- 5) **Movable All Risks Insurance (MRI):** This insurance shall cover the damage to and/or loss of the CONSTRUCTION EQUIPMENT including watercraft and aircraft and further including the CONTRACTOR's TEMPORARY WORKS, owned, non-owned, hired or otherwise placed under the CONTRACTOR's administration and control with the full replacement value coverage for each and every occurrence.
- 6) **Other Insurance**  
Other insurance which shall be necessary or which the CONTRACTOR deems necessary for proper performance of the WORKS e.g

- Overseas (and/or Domestic) Travellers' accident Insurance.
- Burglary Insurance
- All Risks marine cargo Insurance for the CONTRACTOR's CONSTRUCTION EQUIPMENT, tools and machinery, and for equipment and materials that the CONTRACTOR's TEMPORARY WORKS and that the CONTRACTOR under the CONTRACT may supply for the WORKS and/or the PERMANENT WORK and
- Fidelity Guarantee Insurance
- The CONTRACTOR agree that the provisions of this Clause shall to the extent as appropriate, be apply all the contracts that may for the WORKS be entered into by and between the CONTRACTOR and the respective SUBCONTRACTORS and unless the CONTRACTOR furnished insurance called for by the CONTRACT are good also for the SUBCONTRACTORS their properties and/or their liabilities in connection with the WORKS the CONTRACTOR shall include in such contracts as aforementioned the requirements for insurance conforming to this clause. Inclusion of such insurance requirements in such contracts as afore mentioned however, shall

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not release the CONTRACTOR from any of his responsibilities and liabilities under the CONTRACT.

- Group term life Insurance cover to be taken having a risk coverage 24 X 7 death coverage (Natural /Accidental death) with a sum assured of Rs.10,00,000/- (Rs.Ten lakhs only).

#### **14.0 PRICE, TAXES AND DUTIES**

- 14.1 The quoted price shall be deemed to be inclusive of all taxes / duties / cess / levies / fees etc except “Goods and Services Tax” (hereinafter called GST) (i.e., IGST or CGST and SGST/UTGST as applicable in case of interstate supply or intra state supply respectively and GST compensation Cess if applicable), except as specifically provided to the contrary in the Special Conditions of Contract.
- 14.2 The quoted price shall be deemed to be inclusive of all taxes / duties / cess / levies / fees etc including GST as applicable and CONTRACTOR only shall within their quoted price be liable to pay and bear any and all duties, taxes, levies, cesses etc. lawfully payable or liable to be payable on any goods, equipment or materials imported into India or procured within any local limits for incorporation in the work(s) at contractor’s end.
- 14.3 The CONTRACTOR shall be liable for and shall pay any and all fees, cesses, taxes, duties, levies etc. assessable against CONTRACTOR in respect of or pursuant to the Contract.
- 14.4 In addition, the CONTRACTOR shall be responsible for payment of all duties, levies, and taxes assessable against the CONTRACTOR or CONTRACTOR’s employees or their Sub Contractors whether corporate or personal or applicable in respect of property.
- 14.5 Any errors of interpretation of applicability of all taxes / duties / cess / levies / fees etc by the CONTRACTOR shall be to CONTRACTOR’s account.

#### **14.6 Goods and Services Tax (GST)**



GST is implemented by Government of India w.e.f 01.07.2017. “GST” shall mean Goods and Services Tax charged on the supply of Goods and Services. The term “GST” shall be construed to include the Integrated Goods and Services Tax (hereinafter referred to as “IGST”) or Central Goods and Services Tax (hereinafter referred to as “CGST”) or State Goods and Services Tax (hereinafter referred to as “SGST”) / Union Territory Goods and Services Tax (hereinafter referred to as “UTGST”) depending upon the import / interstate or intrastate supplies, as the case may be. It shall also mean GST compensation Cess.

#### **14.7 Invoicing under Goods and Services Tax (GST) Rules:**

- CONTRACTOR shall be required to issue tax invoice in accordance with GST and GST Rules, as applicable from time to time, so that input credit can be availed by Owner. In the event that the CONTRACTOR fails to provide the invoice in the form and manner prescribed under the GST Act read with GST Invoicing Rules there under, Owner shall not be liable to make any payment on account of GST against such invoice.

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- ii. As per Section 17 (5) c) of CGST Act, the Owner will not get Input Tax credit for Works contract services when supplied for construction of an immovable property (other than plant and machinery).
- iii. GST shall be paid against receipt of tax invoice. Contractor / Vendor shall forthwith upload the appropriate document at GSTN portal complying with all GST regulations including but not limited to payment of GST by contractor / vendor. In case of non-receipt of tax invoice or non-payment of GST by the CONTRACTOR, Owner shall withhold the payment of GST.
- iv. GST payable under reverse charge for specified services or goods under GST act or rules, if any, shall not be paid to the CONTRACTOR. If the same has already been reimbursed / paid to the Contractor for any reason whatsoever, the said amount shall be deducted / recovered / adjusted from the payment due to the Contractor.
- v. Further, GST payment shall be limited to the amount worked out on the total executed and certified amount (on which GST is applicable) based on the contracted rates.
- vi. The CONTRACTOR shall mention their registration status (Registered / Composition / Unregistered) on the bill / invoice. In case there is change in the Registration status of the CONTRACTOR during the execution of the contract the same should be advised immediately. Due to change in the Registration status. Owner will not be liable for any additional payments, whatsoever, including tax payments.
- vii. The classification of goods/services as per GST Tariff should be correctly done by the CONTRACTOR to ensure that input tax benefit is not lost to the OWNER on account of any error on the part of the CONTRACTOR.
- viii. The CONTRACTOR shall comply with all the provisions of the GST Act /Rules / requirements like providing of tax invoices, payment of taxes to the authorities within the due dates, filing of returns within the due dates etc. To enable Owner to take Input Tax Credit. The CONTRACTOR shall always comply with the requirements of applicable laws and provide necessary documents as prescribed under the Rules & Regulations, as applicable from time to time. In particular, if any tax credit, refund or other benefit is denied or delayed to OWNER due to any non-compliance / delayed compliance by the CONTRACTOR under the Goods & Service Tax Act (such as failure to upload the details of the sale on the GSTN portal, failure to pay GST) or due to non-furnishing or furnishing of incorrect or incomplete documents by the CONTRACTOR, the CONTRACTOR shall be liable to reimburse OWNER for all such losses and other consequences including, but not limited to the tax loss, interest and penalty. Notwithstanding anything contained anywhere in the Agreement, Owner shall be entitled to recover such amount from the CONTRACTOR by way of adjustment from the invoice or from any other Securities like Bank Guarantees available to Owner. In addition to the amount of GST, OWNER shall also

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be entitled to recover interest at the rate prescribed under GST Act and penalty, in case any penalty is imposed by the tax authorities on Owner.

- ix. Notwithstanding anything contained anywhere in the Agreement, in the event that the input tax credit of the GST charged by the Contractor / Vendor is denied by the tax authorities to OWNER due to reasons attributable to Contractor/Vendor. / OWNER shall be entitled to recover such amount from the Contractor / Vendor by way of adjustment from the next invoice or from Bank Guarantee. In addition to the amount of GST, / OWNER shall also be entitled to recover interest and/or penalty, as the case may be, imposed by the tax authorities on / OWNER.
- x. Notwithstanding anything contained anywhere in the Agreement, any cost, liability, dues, penalty, fees, interest as the case may be, to which OWNER becomes liable, at any point of time on account of non-compliance of applicable tax laws or rules or regulations thereof or otherwise due to default on the part of CONTRACTOR shall be borne by the CONTRACTOR. Such cost, liability, dues, penalty, fees, and interest as the case may be shall be paid forthwith by the CONTRACTOR and /or OWNER shall be entitled to recover such amount from the CONTRACTOR by way of adjustment from the invoice or from any other Securities like Bank Guarantees available to OWNER. Any GST as may be applicable on such recovery of amount shall also be borne by CONTRACTOR.”
- xi. TDS under GST, if applicable, shall be deducted from CONTRACTOR’s bill at applicable rates. A certificate for tax deducted at source by OWNER shall be provided to CONTRACTOR.
- xii. CONTRACTOR shall raise their invoice in favour of OWNER with following details:  
Mangalore Refinery and Petrochemicals Limited  
Kuthethoor P.O., Via Katipalla Mangaluru- 575030.  
**GSTIN: 9AAACM5132A1ZZ**  
**PAN: AAACM5132A**

#### 14.8 Road Permits / Way bills

- (i) CONTRACTORS shall arrange Road Permits / Way bills etc. By themselves and comply with all applicable statutory laws.
- (ii) In case statutory laws require issuance of Road Permit / Way bill etc. is to be arranged by the OWNER, OWNER will arrange to issue the same. In case any implication of the same is borne / to be borne by Owner and the same shall be adjusted against the payments due to CONTRACTORS against their bills or from any other Securities like Bank Guarantees.
- (iii) The CONTRACTOR will be under obligation for proper utilization of the same for the specific supply and in case of seizure of goods / vehicle; the CONTRACTOR will be wholly responsible for release and also pay the litigation cost of Owner. Owner also reserves the right to recover the

same against the payments due to CONTRACTORS against their bills or from any

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other Securities like Bank Guarantees available to Owner.

#### 14.9 NEW TAXES & DUTIES

All new taxes / duties / cess / levies / fees notified after the date of unpriced bid opening / submission of any subsequent price implication / revised prices, but within Time for Completion / extended Time for Completion (by Owner due to reason attributable to OWNER), shall be to Owner's account. These shall be reimbursed against documentary evidence. However, in case of delay attributable to contractor, any new taxes / duties / cess / levies / fees imposed after Time for contractual Completion, shall be to contractor's account.

#### 14.10 STATUTORY VARIATIONS

No variation on account of taxes / duties / cess / levies / fees, statutory or otherwise, shall be payable by OWNER to CONTRACTOR except for the variation in GST.

Any Increase in GST after the contractual completion period (including extended Completion period shall be to CONTRACTOR's account, however, any decrease shall be passed on.

#### 14.11 INCOME TAX

The CONTRACTOR shall be exclusively responsible and liable for all Direct Taxes, including income tax, profession tax and wealth tax, whether payable in India or in any other jurisdiction.

The CONTRACTOR shall be responsible for ensuring compliance with all provisions of the direct tax laws of India including, but not limited to, the filing of appropriate Returns and shall promptly provide all information required by the owner for discharging any of its responsibilities under such laws.

Tax shall be deducted at source by OWNER from all sums due to CONTRACTOR in accordance with the provisions of the Income Tax Act, as in force at the relevant point of time.

OWNER shall issue a Tax deduction or withholding certificate to the CONTRACTOR evidencing the Tax deducted or withheld and deposited by OWNER on payments made to the CONTRACTOR.

#### 14.12 FIRM PRICES

The quoted price shall remain firm and fixed and valid until completion of the contract and shall not be subject to escalation for any reason what so ever.

#### 15.0 INTEGRITY PACT

Pro-forma of Integrity Pact (IP) as per FORM - M of Proposal Forms shall be returned by the bidder along with the unpriced bid, duly signed on all pages by the same signatory who is authorized to sign the bid documents. Bidder's failure to submit the Integrity Pact



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duly signed shall result in the bid not being considered for further evaluation.

**16.0 SETTLEMENT OF DISPUTE BETWEEN GOVERNMENT DEPARTMENT/ PUBLIC SECTOR UNDERTAKINGS**

If the CONTRACTOR is a PSU or Enterprise or is a Govt. Department, any disputes or differences between the Contractor and OWNER hereto arising out of any notified claim of the Contractor in terms hereof and/or arising out of any amount claimed by OWNER (whether or not the amount claimed by OWNER or any part thereof shall have made to the CONTRACTOR in respect of the work), then in

suppression of the provisions of Section 9 of the General Conditions of Contract, the following provisions shall apply, namely; such disputes or differences shall be resolved amicably by mutual consultation or through the good offices or empowered agencies of the Government. If such resolution is not possible, then the unresolved disputes or differences shall be referred to arbitration of an arbitrator to be nominated by the Secretary, Department of legal affairs (Law Secretary) in terms of the Office Memorandum No. DPE/4(10)/2001- PMA-GL-I date 22nd January, 2004 issued by the Cabinet Secretariat (Department of Cabinet Affairs) as modified from time to time.

The Arbitration Act shall not be applicable to the arbitrator under this clause. The award of the arbitrator shall be binding upon parties to the dispute, provided, however any party aggrieved by such award may make a further reference for setting aside or revision of the award to Law Secretary whose decision shall bind the parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the arbitrator.

**17.0 ERRANT BIDDER**

In case after price bid opening the lowest evaluated bidder (L1) is not awarded the job for any mistake committed by him in bidding or withdrawal of bid or varying any term in regard thereof leading to re- tendering, OWNER shall forfeit Earnest Money paid by the bidder and such bidders shall be debarred from participation in re-tendering of the same job(s)/item(s).

**18.0 CORRUPT AND FRAUDULENT PRACTICES**

Bidders are required to furnish the complete and correct information/ documents required for evaluation of their bids. If the information/ documents forming basis of evaluation is found to be false/ fake/ forged, the same shall be considered adequate ground for rejection of the bids and forfeiture of earnest money deposit. OWNER requires that the CONTRACTOR observes the highest standard of ethics during the execution of Contract. In pursuance of this policy, OWNER defines, for the purposes of this provision, the terms set forth below as follows:

- a. "Corrupt Practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of public official in contract execution; and
- b. "Fraudulent Practice" means a misrepresentation of facts in order to influence the execution of a Contract to the detriment of OWNER, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive OWNER of the benefits of free and



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open competition.

- c. “False/Fake” means to make or construct falsely. “Faked alibi” is a made, manufactured, or false alibi.  
 Something that is not what is purports to be; counterfeit, an imposter.
- d. “Forgery” means the false making or the material altering of a document with the intent to defraud. A signature of a person that is made without the person’s consent and without the person otherwise authorizing it. A person is guilty of forgery if, with the purpose to defraud or injure anyone or with knowledge that he is facilitating a fraud or injury to be perpetrated by anyone, the actor (i) alters any writing of another without his authority (ii) makes, completes, authenticates, executes, issues or transfers any writing, so that it purports to be the act of another who did not authorize that act or to have been executed at a time or place or in a numbered sequence other than was in fact the case, or to, be a copy of an original when no such original exists. Utters any writing which he knows to be false in a manner specified in (i) & (ii) above.

OWNER may terminate the Contract if it discovers subsequently that the Contractor had engaged in Corrupt Practices or Fraudulent Practices in competing for the Contract. The Contractor is required to execute the “Integrity Pact” if specified in the Bidding Document.

In case, the information/ document furnished by the Contractor forming basis of evaluation of its Bid is found to be false / fake/ forged after the award of the Contract, OWNER shall have the right to terminate

the Contract and get the remaining Works executed by a third party at the risk & Cost of the Contractor and without any prejudice to other rights available to OWNER under the Contract such as forfeiture of the Contract Performance Bank Guarantee, withholding of payment etc.

In case, this issue of submission of false/fake documents comes to the notice after execution of the Works, OWNER shall have full right to forfeit any amount due to the Contractor along with forfeiture of the Contract Performance Bank Guarantee furnished by the Contractor.

Further, any Contractor which is found guilty of any Corrupt or Fraudulent Practice or submission of false/fake /forged documents, shall be put on the negative/ holiday list of OWNER debarring them from future business with OWNER.

#### **19.0 INDEMNITY BOND:**

Contractor shall sign an Indemnity Bond before starting the work, indemnifying the owner and the E.I.C from any damages, prosecution, other legal suits and claims arising out of any mishaps occurring at the site due to faulty from work, faulty construction and for violating rules and regulations for which the contractor shall be solely responsible. The Indemnity Bond shall be executed only in the form as in the General Conditions of Contract.

#### **20.0 BROAD GUIDELINES FOR EFFECTIVE IMPLEMENTATION OF CONTRACT MANAGEMENT**

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**SYSTEM AND MEETING OF STATUTORY REQUIREMENTS IN ENGAGEMENT OF SECONDARY WORKFORCE**

A. Wherever a work order is issued following documents are required to be submitted to HR Department by Contractor duly signed by Engineer in Charge :

I) Where labour engaged by the Contractors is less than 19 :

1. Copy of the valid Work Order/ LOA Copy.
2. Work Commencement letter by the Contractor in Form 6A/ Notice of commencement.
3. Register of Workmen in Form No. XIII.
4. Copy of PF Code allotted by the Competent authority.
5. Copy of ESI code allotted by the competent authority.
6. Workmen's compensation policy.
7. Age proof, Aadhar card number and Bank account details of the worker.

II) Where labour engaged by the Contractors is more than 19 :

1. Copy of the valid Work Order.
2. Work Commencement letter by the Contractor Form 6A/ Notice of commencement.
3. Register of Workmen in Form No. XIII.
4. Copy of PF Code allotted by the Competent authority.
5. Copy of ESI code allotted by the Competent authority.
6. Request letter from the Contractor for issuance of Form No. V for apply labour license through EIC.
7. Submission of Form No. IV for proof of applying labour license attested by the ALC.
8. Interstate migrant license copy if labour engaged more than five frm other states.
9. Workmen's compensation policy.
10. Age proof, Aadhar card number and Bank account details of the worker.

III) Documents required on monthly basis duly certified by Engineer in Charge:

1. Wage Register duly certified by the Engineer Incharge.
2. Attendance Register duly certified by Engineer Incharge.
3. Payment of wages should be disbursed within 7 days from the close of wage period.
4. ESI/ PF Challans receipt along with PF-ECR Copy & Monthly contribution details for payment permitted to Statutory Authorities in respect of the wages paid for the previous month with covering letter.
5. Bank Statement for wages paid.
6. Insurance copy for those who are not covered under ESI Act.
7. Form No. 5 & 10 and Male and female data for each month.

B. Documents required on Annual basis for release of Bank Guarantee/ Security Deposit duly certified by the Engineer Incharge:

1. Work Completion letter by the Contractor in Form 6A/ Notice of completion.
2. Annual Medical Check-up data.
3. Payment of bonus as per Statue.
4. Payment of leave with wages @ 1day for the every 20 days worked by workers.
5. Payment of gratuity if applicable (on completion of 5years of continuous service)

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6. NOC from Security Department on surrendering of punch card and entry pass issued by MRPL.
7. Register of overtime. Form No. XXIII.
8. Wage slip in Form no. XIX.
9. Register of damages or loss Form no. XX.
10. Register of fine. Form No. XXI.
11. Register of Advance form no. XXII.
12. Employment card XIV.
13. Indemnity bond
14. Half yearly/ yearly labour return in form XXIV (see rule 82(1)) to the licensing officer under contract labour returns.
15. Half yearly return in form 5A (regulation 26) on ESI contribution.

**C. PROCEDURE ADOPTED BY HR IN DEALING WITH CONTRACTORS:**



1. Contractor shall submit the documents as specified above with a cover note signed through EIC to HR Department.
2. On submission of compliance report/ recommendations from EIC, HR will give clearance to Finance for release of payment.
3. Any deviation from the above procedure and non-production of required documents will result in delay in issuance of gate pass and payment of monthly bill, final bill and release of retention money/ Security Deposit/ Bank Guarantee.
4. Contractor should also give an indemnity bond to MRPL absolving MRPL of all statutory, non-statutory clearance by their employees, sub-contractors and suppliers.

**21.0 GENERAL GUIDELINES TO SUPPLIERS (AS APPLICABLE) FOR ENVIRONMENT AND ENERGY COMPATIBILITY**

MRPL is an organization which is certified to ISO 14001 Environment Management System and ISO 50001 Energy Management System and looks forward to its service providers to help them maintain the system that is designed for this purpose.

All suppliers are to ensure compliance to the following while they are providing Materials to MRPL or providing services within the premises of MRPL .

- a) Ensure that the products supplied are Eco friendly (easily disposable as bio-degradable waste and the end of life or with a buy back condition), when not covered by PO specification.
- b) Products supplied should be non-polluting when in operation/service.
- c) Items supplied are to be energy efficient i.e. "Star rated".
- d) Ensure that the packing and Packaging material used are disposal as bio-degradable waste or with buy back condition.
- e) Material Safety Data Sheets contain environment /energy related data /information on energy efficiency usage, storage, spillage and easy disposal.
- f) Specify action to be taken for spillages, if any to prevent contamination of air, land and water.

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- g) Ensure that there is no threat to environment during transportation to and returns from MRPL, during delivery / while supplying materials.
- h) Material supplied should not lead to damage or harm to vegetation and greenery while usage and disposal.
- i) Supplier shall comply with all applicable regulations regarding the supplied Goods including all materials used and shall provide all information necessary by such regulation and/or requested by MRPL
- j) Supplier shall be responsible, where physically possible, to take the Goods back for the purpose of recycling them within the scope of the statutory requirements or to dispose them in an environmentally-friendly manner.
- k) Suppliers are to take action and comply with requirements when failures are intimated by MRPL and repeated failures /failure to act may lead to termination of contracts.
- l) Ensure that the noise and pollution levels of vehicles and equipment when used to deliver goods are as per regulatory norms and are subject to verification.

## **22.0 GENERAL GUIDELINES TO SERVICE PROVIDERS (AS APPLICABLE) FOR ENVIRONMENT AND ENERGY COMPATIBILITY**

MRPL is an organization which is certified to ISO 14001 Environment Management System and ISO 50001 Energy Management System and looks forward to its service providers to help them maintain the system that is designed for this purpose.

All service providers are to ensure compliance to the following while they are providing Materials to MRPL or providing services within the premises of MRPL.

- a) Ensure that the products used while providing service are Eco friendly (easily disposable as bio-degradable waste and the end of life or with a buy back condition), when not covered by PO specification
- b) Activities of the service provider should be non-polluting either by design or through control.
- c) Equipment's brought for providing service are energy efficient i.e. star rated
- d) Ensure that the packing and Packaging material brought are disposal as bio-degradable waste or with buy back condition.
- e) Material Safety Data Sheets are available for material brought for providing service and contain environment /energy related data / information on energy efficiency usage, storage, spillage and easy disposal.
- f) Follow action specified by MRPL to be taken for spillages, if any to prevent contamination of air, land and water.
- g) Ensure that there are no threats to environment during transportation of material to and returns from MRPL to be used for providing service to MRPL.
- h) Material brought for usage and disposed at MRPL, should not lead to damage or harm to vegetation and greenery.
- i) Supplier shall comply with all applicable regulations regarding the materials used and shall provide all information necessary by such regulation and/or requested by MRPL
- j) Supplier shall be responsible, where physically possible; to take the Goods back for the purpose of recycling them within the scope of the statutory requirements or to dispose them in an environmentally- friendly manner, when covered by contract.
- k) Suppliers are to take action and comply with requirements when failures are intimated

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by MRPL and repeated failures /failure to act may lead to termination of contracts.

- l) Ensure that the noise and pollution levels of vehicles and equipment used for providing service within MRPL are as per regulatory norms and are subject to verification
- m) Segregate waste generated when providing service as per the scope of work as per MRPL norms i.e. Metal, Bio-degradable, Non-biodegradable, Solid waste and Hazardous waste,.
- n) Dispose waste generated as per MRPL norms in the appropriate waste bins provided.
- o) Prevent / minimize /control /contain pollution by control on emission of gases, spillages when providing service as per the scope of work
- p) Supplier shall be responsible, where physically possible, to take its Goods back for the purpose of recycling them within the scope of the statutory duties or to dispose of them in an environmentally-friendly manner.
- q) Follow safety precautions as per MRPL norms, when providing service as per the scope of work.
- r) Prevent wastage, excessive consumption and misuse of Electricity, steam and water.

### 23.0 PURCHASE PREFERENCE LINKED WITH LOCAL CONTENT (PP-LC 2017) -

MOP&NG has notified the purchase preference(linked with local content)-PP-LC for the Procurement of goods and services under Oil & Gas Projects in India. Under this Policy, the bidders are allowed to avail the purchase preference linked with attaining the stipulated Local content.

MRPL reserves the right to allow Manufacturers or Suppliers or Service providers, purchase preference as admissible under the prevailing policy, subject to their complying with the requirements/conditions defined herewith and submitting documents required to support the same. In order to avail the Purchase preference under this policy, bidder shall achieve minimum Local Content (LC) for enquiries floated year-wise (Date of Notice inviting tender) as per table given below.



**Table of Local Content-Enclosure-1**

Items	Local Content (%)		
	2017-18	2018-20	2020-22
Service Contracts	20%	22%	25%
Supply Contracts	20%	22%	25%
EPC Contracts (others)	30%	35%	40%

#### Notes

6. Above policy is not applicable for Domestically Manufactured Electronic Products (DMEP) and MSME as there being specific policies for products/services
7. The prescribed local content in above table shall be applicable on the date of Notice Inviting Tender.



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**A) Margin of Purchase Preference**

The manufacturers/service providers having the capability of meeting/ exceeding the local content targets given above shall be eligible for 10% purchase preference under the policy. i.e where the quoted price of eligible LC manufacturers/LC service providers is within 10% of the lowest price, purchase preference may be granted at the lowest valid price bid.

**B) Procedure for availing benefits under Purchase Preference (Make in India Policy)**

The option in case of MSE bidders qualifying under both Policies, namely, Purchase Preference under the Public Procurement Policy - 2012 (PPP-2012) for MSE bidders and Purchase Preference Linked with Local Content (PP-LC 2017) shall be exercised as under:

- i. The MSE bidder can avail only one out of the two applicable purchase preference policies, i.e., PP-LC 2017 for PPP-2012 and therefore, bidder will be required to furnish the option under which he desires to avail purchase preference. This option must be declared within the offer and in case bidder fails to do so although he is eligible for both the Policies, MRPL shall evaluate his offer considering PPP- 2012 as the default chosen option.
- ii. In case a MSE bidder opts for preference under PPP-2012, he shall not be eligible to claim benefit under PP- LC 2017 (irrespective of the fact whether he furnishes the details of LC in his offer and this LC meets the stipulated LC criteria).
- iii. In case a MSE bidder opts for purchase preference based on PP-LC 2017, he shall not be entitled to claim benefit of purchase preference benefit as applicable for MSE bidders under PPP-2012. However the exemptions from furnishing Bid security (EMD) shall continue to be available to such a bidder.
- iv. In view of the above
  - a) The bidder's quoted prices against various items of enquiry shall remain valid even in case of splitting of quantities of the items, except in case of items where the quantity cannot be split since these are to be awarded in a Lot or as a package or Group.
  - b) While evaluating the bids, for price matching opportunities and distribution of quantities among bidders, the order of precedence shall be as under:
    - MSE bidder (PPP-2012)
    - PP-LC complied bidder (PP-LC)

In case the bidder has not declared his status as to whether he is an MSE Bidder or PP-LC Bidder during bid submission, then he will be considered as non PP-LC compliant bidder and evaluated accordingly. No further correspondence will be made in this regard.

**Examples of Purchase Preference:**

**Non divisible item**

L1 bidder is non MSE, non PP-LC

bidder L2 bidder is PP-LC (within



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10%)

L3 bidder is MSE bidder (within 15%)

MSE bidder shall be given preference to match the L1 price. If L3 bidder matches the L1 price, Order shall be placed on him, otherwise, option for matching the L1 price shall be given to L2 bidder (PP-LC).

#### Divisible item

L1 bidder is non MSE, non PL-LC

bidder L2 bidder is PP-LC (within

10%)

L3 bidder is MSE bidder (within 15%)

MSE bidder shall be given preference to match the L1 price. If bidder matches the L1 price, order shall be placed on him for the quantity specified in the bidding document. For the balance quantity (i.e. 50% of tendered quantity/value) option for matching the L1 price shall be given to L2 bidder (PP-LC). Balance quantity shall be awarded to natural lowest bidder.

For further clarification, in case an item has quantity 4 nos. then 1 no. can be given to MSE bidder, 2 to PP-LC bidder and left out 01 no. to natural L1 bidder.

Note:

The above two examples are not applicable to the Works Contracts since the Purchase Preference under PPP-2012 is not applicable to works contracts.

- In case lowest bidder is a MSE bidder, the entire work shall be awarded to him without resorting to purchase preference to bidders complying with Local Content.
- In case lowest bidder is a PP-LC bidder, purchase preference shall be resorted to MSE bidder as per provisions specified in the enquiry document w.r.t. PPP-2012 only.

#### **The PP-LC Policy shall be implemented in the following manner**

Quantum of purchase preference for bidders qualifying under local content (for LC Bidder) meeting minimum local content, subject to accepting L1 Price and tender applicability criteria, referred to as eligible LC bidder as explained under previous sections are stated below.

A. For goods

- 1) If L-1 is LC bidder, entire quantity will be awarded to such LC bidder
- 2) If L-1 is non-LC bidder,

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**Bidder's Seal & Signature**

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- a) 50% of the quantity will be awarded to LC bidder and rest to non-LC bidder
- b) If quantity cannot be split in the ratio of 50:50, the next higher quantity greater than 50% that is practically splittable shall be awarded to LC bidder and rest to non-LC bidder
- c) If quantity is indivisible, 100% shall be awarded to LC bidder
- d) If there are more than one LC bidders, 50% quantity shall be awarded to lowest LC bidder and rest to non LC bidder

**B. For Services/ EPC contracts.**

Normally the service / EPC contract are not split-able and therefore the eligible LC bidder shall be awarded 100% of the contract. However, in cases where the contract are split-able the LC bidder shall be awarded contract as explained under section A.2) above as in procurement of goods.

**C) CERTIFICATION OF LOCAL CONTENT**

Manufacturers of goods and/or providers of service, seeking Purchase preference under the policy, shall be obliged to certify the LC of goods, service or EPC contracts as under

**At bidding stage:**

The bidder shall provide the percentage local content in the bid (Unpriced Bid)

The bidder must have LC in excess of the requirement specified in table given in Enclosure-1

- The bidder shall submit an undertaking from the authorized signatory of the bidder having the **power of attorney** along with the bid stating the bidder meets the mandatory minimum local content requirement, which shall become part of the contract.
- In cases of procurement for an estimated value in excess of Rs 10 Crores, the undertaking submitted by the bidder shall be supported by a certificate from the **statutory auditor or cost auditor** of the company (in case of companies) or from a **practicing cost accountant or practicing chartered accountant** (in respect of other than companies) **giving the percentage of local content.**
- However, in case of foreign bidder, certificate from the statutory auditor or cost auditor of their own office or subsidiary in India giving the percentage of LC is also acceptable. In case office or subsidiary in India does not exist or Indian office/subsidiary is not required to appoint statutory auditor or cost auditor, certificate from practicing cost accountant or practicing chartered accountant giving the percentage of LC is also acceptable.

**After awarding of Contract/Purchase Order**

The LC Certificate as per Table attached as per relevant Enclosures (II, III & IV) shall be submitted along with each Invoice as per following criteria

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a) **Where the total quoted value is less than INR 5 Crore:**

In the case of procurement of goods and or services with the value less than Rs Five Crores, the local content shall be calculated (self-assessment) by the supplier of goods and/or the provider of services and certified by the Director/ Authorised representative of the company

b) **Where the total quoted value is INR 5 Crore or above** -The verification of the procurement of goods, services or EPC contracts with the value Rupees Five Crore and above shall be carried out as follows



- i. The Proprietor and an independent Chartered Accountant, not being an employee of the firm, in case of a proprietorship firm.
- ii. Any one of the partners and an independent Chartered Accountant, not being an employee of the firm, in case of a partnership firm.
- iii. Statutory auditors in case of a company. However, where statutory auditors are not mandatory as per laws of the country where bidder is registered, an independent chartered accountant, not being an Employee of the bidder's organization.

However, procuring company shall also have the authority to audit as well as witness production processes to certify the achievement of the requisite local content and/or to obtain the complete back up calculation before award of work failing which the bid shall be rejected and appropriate action may be initiated against the bidder.



**D) CALCULATION AND DETERMINATION OF LOCAL CONTENT**

**Bidder claiming Local Content have to calculate the LC and indicate the same in the Unpriced Bid and substantiate the calculation while submitting each invoice**

1. LC shall be calculated on the basis of verifiable data. In the case of data used in the calculation of LC being non verifiable, the value of LC of the said component shall be treated as nil.
2. Format for calculation of LC is enclosed as
  - a) Enclosures II, for procurements of
    - a) Supply of goods
      - i) Supply of goods along with installation and commissioning
      - ii) Supply of goods along with installation , commissioning & AMC
    - b) Enclosure III for calculation of LC for Services
    - c) Enclosure IV for calculation of LC for EPC
3. Determination of Local Content
  - a) For Goods/installation & commissioning/AMC as evaluated under Enclosure II
    - i. LC of goods shall be computed on the basis of the cost of domestic components in goods, compared to the whole cost of product. The whole cost of product shall be constituted of the cost spent for the production of goods, covering: direct component (material) cost; direct manpower cost, factory overhead cost and shall exclude profit, company overhead cost and taxes for the delivery of goods.
    - ii. The criteria for determination of local content cost shall be as following

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- In the case of direct component (material) based on country of Origin
  - In the case of manpower, based on INR component
  - In the case of working equipment/facility, based on the country of Origin
- iii. The calculation of LC of the combination of several kinds of goods shall be based on the ratio of the sum of the multiplication of LC of each goods with the acquisition price of each goods to the acquisition price of the combination of goods
- b) For services as evaluated under Enclosure III
- I) LC of service shall be calculated on the basis of the ratio of service cost of domestic component in service to the total cost of service
- II) The total cost of service shall be constituted of the cost spent for rendering of service covering
- Cost of component (material) which is used
  - Manpower and consultant cost, cost of working equipment/facility and
  - General service cost excluding profit, company overhead cost , taxes and duties
- III) The criteria for determination of cost of local content in the service shall be as follows
- In the case of material being used to help the provision of service, based on country of origin
  - In the case of manpower and consultant based on INR component of the services contract
  - In the case of working equipment/facility, based on the country of Origin and
  - In the case of general service cost, based on the criteria mentioned under 3.b)III above
  - Indian flag vessels in operation as on date
  -
- c) LC of EPC contracts given under Enclosure IV
- I) LC of EPC contracts shall be ratio of the whole cost of domestic components in the combination of goods and services to the whole combined cost of goods and services
- II) The whole combined cost of goods and services shall be the cost spent to produce the combination of goods and services, which is incurred on work site. LC of the combination of goods and services shall be counted in every activity of the combination work of goods and services
- III) The spent cost as mentioned above(3.c.II) shall include production cost in the calculation of LC of goods as mentioned in 3.a.I and service cost in the calculation of LC of services as mentioned in clause 3.b.II
- d) Determination of LC of the working equipment/facility shall be based on the

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following provision. Working equipment produced in the country is valued as 100% local content and working equipment produced abroad is valued as Nil Local Content (0%)

- e) As regards cases where currency quoted by the bidder is other than INR, exchange rate prevailing on the date of Tender (NIT) shall be considered for the calculation of LC

The onus of submission of appropriately certified documents lies with the bidder and purchaser shall not have any liability to verify the contents & will not be responsible for same.

However, in case the procuring company has any reason to doubt the authenticity of the Local Content, it reserves the right to obtain the complete back up calculations before award of work failing which the bid shall be rejected.

**E) Failure of bidder in complying with the local content post award:**

In case a bidder, who has specified in his bid that the bid meets the minimum Local Content specified in the enquiry document fails to achieve the same the following actions shall be taken by the procuring company:



- Pre-determined penalty @ 10% of total contract value.
- Banning business with the supplier/contractor for a period of one year

To ensure the recovery of above pre-determined penalty, payment against dispatch/shipping document shall be modified to the extent that the 10% payment out of this milestone payment shall be released after completion of this milestone as well as submission of certification towards achievement of Local Content, as per provision of enquiry document. Alternatively, this payment can be released against submission of additional bank guarantee valid till completion Schedule Plus 3 months or as required by purchasing company.

**Enclosure-II**

**CALCULATION OF LOCAL CONTENT - GOODS**

Name of Manufacturer	Calculation by manufacturer			
	Cost per one unit of product			
Cost component	Cost (Domestic component) a	Cost (Imported component) b	Cost Total Rs/US \$ C=a+b	% Domestic component d=a/c



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I.	Direct material cost				
II.	Direct labour Cost				
III.	Factory overhead				
IV.	Total production cost				

**Note:**

$$\% \text{ LC Goods} = \frac{\text{Total cost (IV.c)} - \text{Total imported component cost (IV.b)}}{\text{Total Cost (IV.c)}} \times 100$$

$$\% \text{ LC Goods} = \frac{\text{Total domestic component cost (IV.a)}}{\text{Total Cost (IV.c)}} \times 100$$





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Enclosure-IIICALCULATION OF LOCAL CONTENT - SERVICE

NAME OF SUPPLIER OF GOODS/PROVIDER OF SERVICE							
			Cost Summary				
			Domestic	Imported Rs/US\$	Total	LC	
						%	Rs/US\$
b	c	d	e=b/d	f=d x e			
A	Cost component						
	I. Material used cost	Rs US\$					
	II. Personnel & Consultant cost	Rs US\$					
	III. Other services cost	Rs US\$					
	IV. Total cost (I to IV)	Rs US\$					
B	Taxes and Duties	Rs US\$					
C	Total quoted price	Rs US\$					

**Note:**

% LC Service =  $\frac{\text{Total cost (A. IV. d)} - \text{Total imported component cost (A. IV. c)}}{\text{Total cost (A. IV. d)}} \times 100$

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Total Cost (A. IV. d)



% LC Service =  $\frac{\text{Total domestic component cost (A. IV. b)}}{\text{Total Cost (A. IV. d)}} \times 100$

Total Cost (A. IV. d)

### Enclosure-IV

#### CALCULATION OF LOCAL CONTENT -EPC (GOODS AND SERVICE)

A.	COST COMPONENT (Rs/US\$)	Cost Summary				
		Domestic	Imported Rs/US\$	Total	LC	
					%	Rs/US\$
		b	c	d	e=b/d	f=d x e
I	GOODS					
1.	Material used cost					
2.	Equipment cost					
3.	<b>Sub Total I</b>					
II	SERVICES					
1.	Personnel & Consultant cost					
2.	Equipment & Work Facility Cost					
3.	Construction/Fabrication Cost					
4.	Other Services Cost etc.					
5.	<b>Sub Total II</b>					
III.	<b>TOTAL COST GOODS + SERVICES</b>					
B.	Non Cost Component					
C.	<b>TOTAL QUOTED PRICE</b>					

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**Note:**

% LC Combination =

$\frac{\{\text{Total domestic component cost of goods (AI3b)} + \text{Total domestic component cost of service (AI5b)}\}}{\text{Total Cost (AllId)}} \times 100$

Total Cost (AllId)



**Domestically Manufactured Electronic Items (DMEP)**

Ministry of Electronics and IT (MeITy) has specified the preference to local content in Domestically Manufactured Electronics Items as follows:

Electronic Items	Local Content	Purchase Preference
1. Desktop computers	45%	50%
2. Laptop personal computers	40%	50%
3. Tablet personal computers	45%	50%
4. Dot-matrix printers	55%	50%
5. Smart cards-contact type	65%	50%
6. Smart cards-contactless type	70%	50%
7. LED products	65%	50%
8. Biometric Access control/authentication	45%	50%
9. Biometric fingerprint sensors	45%	50%
10. Biometric Iris Sensors	45%	50%
11. Servers	40%	50%

**Certification of Local Content For electronics goods**

It is mandatory for the bidder should submit a certificate duly certified by a practicing cost accountant/chartered account, in line with the said along with  
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prescribed Form (enclosed) in the technical bid, mentioning the location(s) at which local value addition is made. In case of companies, the certification shall be from the statutory auditor or cost auditor for the company. In case the procurement value is <Rs 10Crores self-certification is acceptable.

**The bidder claiming benefits of Purchase Preference on the above shall provide at least 2 sets of data each under the following heads.**

**1. Domestic Bill of Materials**

- a) Sum of the costs of all the inputs which go into the product (including duties and taxes levied on procurement of inputs except those for which credit/setoff can be taken) and which have not been imported directly or through a domestic trader or a intermediary
- b) Ex-factory price of product minus profit after tax minus sum of imported bill of material used (directly or indirectly) as inputs in producing the product (including duties and taxes levied on procurement of inputs except those for which credit/setoff can be taken) minus warranty costs
- c) Market price minus post production freight, insurance and other handling cost minus profit after tax minus warranty cost minus sum of imported bill of material used as inputs in producing the product(including duties and taxes levied on procurement of inputs except those for which credit/setoff can be taken) minus sales and marketing expenses



**2. Total Bill of Materials**

- a) Sum of the costs of all the inputs which go into the product (including duties and taxes levied on procurement of inputs except those for which credit/setoff can be taken)
- b) Ex-factory price of product minus profit after tax, minus warranty costs
- c) Market price minus post production freight, insurance and other handling cost minus profit after tax minus warranty cost minus sales and marketing expenses.

**The percentage domestic value addition shall be calculated as per the following formula,**

$$\% \text{ Domestic Value addition} = \text{Domestic Bill of Material} / \text{Total Bill of Material}$$

Under “notification for electronics products under public procurement order 2017” Public procurement (Preference to Make in India)-order 2017-Notification on Cellular Mobile Phones.

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In furtherance of above order, MeITy has added cellular Mobile Phones vide notification no 33(5)/2017-IPHW dated 1/08/2018 and can be downloaded from [http://dipp.nic.in/sites/default/files/Meity\\_dated\\_01082018.pdf](http://dipp.nic.in/sites/default/files/Meity_dated_01082018.pdf)

### **Public Procurement (Preference to Make in India) Order 2018 for Cyber Security Products**

MeITy has issued notification viz File No 1 (10)/2017-CLSES dated 2/7/2018 to give purchase preference to domestically manufactured /produced Cyber Security Products as per the above Order.

The definition of cyber security product, local supplier of domestically manufactured Cyber Security Products, exclusions, Verifications etc are available under <http://meity.gov.in/cyber-security>

The local supplier at the time of bidding shall provide self-certification that the item offered meets the definition of local supplier of domestically manufactured/ produced Cyber Security Products.



Certification authority for estimated values beyond Rs 10 Crores shall be statutory auditor or cost auditor of the company (in case of companies).

In case of false declarations, provisions under clause-24-Instructions to Bidders of Section-1 of Tender Document will apply. Complaints received against claims of a bidder regarding supply of domestically manufactured Cyber Security Product shall be referred to STQC under MeITy.

For certification of local content in electronic goods shall be as per the circular F.No.33(1)/2017-IPHW issued by Government of India Ministry of Electronics and Information Technology dated 14<sup>th</sup> September 2017, which may be downloaded from <http://meity.gov.in/esdm/ppo>

### **Purchase Preference in case where Negotiation is also required:**

In case purchase preference is applicable, but negotiation is to be conducted with L1 bidder, negotiation shall be carried out MSE and/or LC-complied bidder shall be offered to match the negotiated prices (even if, post negotiation, they are higher by more than 10% as compared to L1 bidder

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provided they were within 10% of L1 bidder as per original quoted prices) and left out quantity, if any, as per provisions of enquiry document shall be awarded to that bidder.

Note:

**Relevant policy guidelines issued including modifications made from time by the concerned Ministry in respect to Purchase Preference to Make in India, shall be applicable.**

**Relevant policy guidelines issued including modifications made from time by the concerned Ministry in respect to Purchase Preference to Make in India, shall be applicable.**



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**UNDERTAKING (To be submitted on Company's Letterhead)**



(Where the total quoted value is less than INR 5 Crore)

I \_\_\_\_\_, Son/ Daughter of \_\_\_\_\_, do solemnly affirm and state as under:

1. That I am the \_\_\_\_\_ <<Designation of the authorized signatory>> of \_\_\_\_\_ and I am duly authorized to furnish this undertaking declaration on behalf of \_\_\_\_\_.
2. That \_\_\_\_\_ has submitted its bid no \_\_\_\_\_ dated \_\_\_\_\_ against bidding document no \_\_\_\_\_ dated \_\_\_\_\_ for \_\_\_\_\_ item / works for \_\_\_\_\_.
3. That the Company is fully aware of the provisions of Purchase Preference (Linked with Local Content) 2017 (PP-LC) Policy, enclosed in the above bidding document.
4. We hereby confirm that our offer is achieving the minimum local content target as per of PP-LC Policy.
5. I confirm that I am aware of the implication of the above undertaking and our liability on account of wrong declaration.

(Authorized signatory of Supplier)

Note : This undertaking shall be certified by the authorized signatory of the bidder, signing the bid.

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**UNDERTAKING (To be submitted on Company's Letterhead)**

(Where the total quoted value is INR 5 Crore or above)

Certification by the bidder

I \_\_\_\_\_, Son/ Daughter of \_\_\_\_\_, do solemnly affirm and state as under:

1. I am the \_\_\_\_\_ <<Designation of the authorized signatory>> of \_\_\_\_\_ and I am duly authorized to furnish this undertaking declaration on behalf of \_\_\_\_\_.
2. That \_\_\_\_\_ has submitted its bid no \_\_\_\_\_ dated \_\_\_\_\_ against bidding document no \_\_\_\_\_ dated \_\_\_\_\_ for \_\_\_\_\_ item / works for \_\_\_\_\_.
3. That the Company is fully aware of the provisions of Purchase Preference (Linked with Local Content) 2017 (PP-LC) Policy, enclosed in the above bidding document.
4. We hereby confirm that our offer is achieving the minimum local content target as per of PP-LC Policy and the break-up of the same is provided in the Priced bid.
5. I confirm that I am aware of the implication of the above undertaking and our liability on account of wrong declaration.

(Authorized signatory of Supplier)

Certification by the statutory auditor / Chartered Accountant of the bidder

We, \_\_\_\_\_, a CA firm having our registered office address \_\_\_\_\_ and certificate number \_\_\_\_\_ certify that we are statutory auditor of the Company M/s \_\_\_\_\_, having its registered office at \_\_\_\_\_.

OR

We, \_\_\_\_\_, a CA firm having our registered office address \_\_\_\_\_ and certificate number \_\_\_\_\_ certify that statutory auditor is not mandatory for the company M/s \_\_\_\_\_, having its registered office at \_\_\_\_\_ as per prevailing law and we are practicing Chartered Accountant, not being an employee / Director and not having any interest in the company.

We have understood the provisions of Purchase Preference (Linked With Local Content) 2017 (PP-LC) Policy, enclosed in the above bidding document.

We hereby certify that offer is achieving the minimum local content target as per of PP-LC Policy.

(Statutory auditor / Chartered Accountant of the bidder)

Note : This undertaking shall be certified by:



The Proprietor and an independent Chartered Accountant, not being an employee of the firm, in case of a proprietorship firm.

ii. Any one of the partners and an independent Chartered Accountant, not being an employee of the firm, in case of a partnership firm.

iii. Statutory auditors in case of a company. However, where statutory auditors are not mandatory as per laws of the country where bidder is registered, an independent chartered accountant, not being an employee of the bidder's organization.

#### **LIST OF ITEMS/ SERVICES TO BE PROCURED FROM INDIAN MANUFACTURERS/SERVICE**

The list of items to be procured from Indian manufacturer/services are as follows

2

4

## ANNEXURE-1 to PP-LC POLICY

**Subject: Policy to provide Purchase preference (linked with local content) (PP - LC) in all Public Sector Undertakings under Ministry of Petroleum and Natural Gas- Amended**

### **1 Preamble**

- 1.1 In tune with Make in India (Mli) campaign in oil and gas sector, the Government has decided to incentivise the growth in local content in goods and services while implementing oil and gas projects in India, and
- 1.2 Whereas the Public procurement policy rests upon the core principles of competitiveness, adhering to sound procurement practices and execution of orders for supply of goods or services in accordance with a system which is fair, equitable, transparent, competitive and cost effective, and
- 1.3 Whereas, the local content can be increased through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them etc.
- 1.4 Whereas incentivising enhanced local content in the procurement of goods and/or services in oil and gas business activities would lead to increased local industry content;
- 1.5 Therefore, the Ministry of Petroleum and Natural Gas (MoPNG) has decided to stipulate the following policy for providing Purchase Preference to the manufacturers/ service providers having the capability of meeting/ exceeding the local content targets in oil and gas business activities;
- 1.6 This policy considers the Local Content (LC) as the added value brought to India through the activities of the oil and gas industry. This may be measured (by project, affiliate, and/or country aggregate) and undertaken through Workforce development and investments in supplier development through developing and procuring supplies and services locally.

### **2 Definitions**

- 2.1 **Oil and Gas Business Activity** shall comprise of Upstream, Midstream and Downstream business activities.

- 2.2 **Domestic products** shall be goods and/or service (including design and engineering), produced by companies, investing and producing in India.
- 2.3 **Local Content** hereinafter abbreviated to LC means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.
- 2.4 **Domestic Manufacturer** shall be business entity or individual having business activity established under Indian law and producing products domestically.
- 2.5 **Supplier** of goods and/or provider of service shall be a business entity having capability of providing goods and/or service in accordance with the business line and qualification thereof and classified as under:
- 'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50% as defined under this Policy.
- 'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than or equal to 20% but less than 50%, as defined under this Policy.
- 'Non-local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than 20%, as defined under this Policy.
- 2.6 **Steering Committee** means the committee to be constituted by MoPNG to provide effective guidance and to oversee the implementation of the Policy on a regular and continuing basis.
- 2.7 **Verification** shall be an activity to verify the accomplishment of LC by domestic manufacturers and/or suppliers of goods and/or providers of service with the data obtained or collected from respective business activities.

- 2.8 **Purchase preference:** Where the quoted price is within the margin of purchase preference of the lowest price, other things being equal, purchase preference may be granted to the bidder concerned, at the lowest valid price bid.
- 2.9 **Local Content (LC)** in Goods shall be the use of raw materials, design and engineering towards manufacturing, fabrication and finishing of work carried out within the country.
- 2.10 **Local Content (LC)** in SeNices shall be the use of services up to the final delivery by utilizing manpower (including specialist), working appliance (including software) and supporting facilities carried out within in the country.
- 2.11 Local Content (LC) in EPC contracts shall be the use of materials, design and engineering comprising of manufacturing, fabrication, assembly and finishing as well as the use of seNices by utilizing manpower (including specialist), working appliance (including software) and supporting facility up to the final delivery, carried out within the country.
- 2.12 **Factory overhead cost** shall be indirect costs of manpower, machine/working appliance/facility and the whole other fabrication costs needed to produce a unit of product with the cost not chargeable directly to specified product.  
t
- 2.13 **Company overhead cost** shall be costs related to the marketing, administration and general affairs cost of the company.
- 2.14 **Indian Company** means a company formed and registered under the Companies Act, 2013.
- 2.15 **Foreign company** means any company or body corporate incorporated outside India which- (a) has a place of business in India whether by itself or through an agent, physically or through electronic mode; and (b) conducts any business activity in India in any other manner.

### 3. Scope



- 3.1 The regulation shall be intended to:
  - 3.1.1 Support and boost the growth of domestic manufacturing sector so as to be able to support oil and natural gas business activities and contribute added value to economy, absorb manpower as well as have national, regional and international competitiveness;
  - 3.1.2 Support and boost the growth of innovation/technology of domestic manufacturing sector.
- 3.2 This policy shall apply to all the Public Sector Undertakings and their wholly owned subsidiaries under the Ministry of Petroleum and Natural Gas; Joint Ventures that have 51% or more equity by one or more Public Sector Undertakings under the Ministry of Petroleum and Natural Gas; attached and subordinate offices of MoPNG.
- 3.3 This policy shall not include goods/ services falling under Micro Small and Medium Enterprises (MSME) or Domestically Manufactured Electronic Products (DMEP), as those products/ services are already covered under specific policy. However, an option would be given in the tender for the bidder to declare preference for seeking benefit under PP-LC/MSME or DMEP.
- 3.4 The policy is not applicable for HP-HT operations for the time being. The Charter Hiring of offshore vessels shall continue to be governed by DG, Shipping Guidelines. Indian Flag Vessels shall be considered as having 100% LC.
- 3.5 The prescribed local content in the Policy shall be applicable on the date of Notice inviting Tender.

#### **4. Procurement**

- 4.1 The procuring companies shall follow their own procurement procedures. Aggregation of annual requirements and such other procurement practices, which facilitate the implementation of this policy, may be adopted by procuring companies.
- 4.2 In respect of Global Tender Enquiry (GTE) the guidelines as issued by Government of India from time to time shall be applicable on the procuring entities.

- 4.3 **Margin of Purchase preference:** The margin of purchase preference shall be 20%.
- 4.4 (a) In respect of all goods, services or works in respect of which the Nodal Ministry/ Department under DPIIT's Public Procurement (Preference to Make in India) Order, 2017 has communicated that there is sufficient local capacity and local competition, only Class-I local supplier shall be eligible to bid irrespective of purchase value.
- 4.4 (b) For all other local tenders, Class-I local supplier and Class-II local supplier shall be eligible to bid irrespective of purchase value, but preference to be given as per PP-LC to the Class-I local supplier.
- 4.4 (c) Only Class-I local supplier and Class-II local supplier, as defined under the Order, shall be eligible to bid in procurements undertaken by procuring entities, except when Global tender enquiry has been issued. In global tender enquiries, Non-local suppliers shall also be eligible to bid along with Class-I local suppliers and Class-II local suppliers.
- 4.4 (d) Class-II local supplier will not get purchase preference in any procurement, undertaken by procuring entities.
- 4.5 In National Competitive Bid procurements of all items not covered by para 4.4 (a) and where the estimated value to be procured i.e. total value of enquiry/ tender, is less than Rs. 1 Crore shall be exempt from this Policy. In case of International Competitive Bids, the policy shall be applicable irrespective of the tender estimate. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this Policy.
- 4.6 The producers of goods and/or providers of services shall be obliged to fulfil the requirements of quality and delivery time in accordance with the provisions of the respective contracts of goods and services.
- 4.7 If the Ministry is satisfied that Indian suppliers of an item are not allowed to participate and/or compete in procurement by any foreign government, it may, if it deems appropriate, restrict or exclude bidders from that country from eligibility for procurement of that item and/or other items relating to the Ministry.

4.8 For the purpose of para 4.7 above, a supplier or bidder shall be considered to be from a country if (i) the entity is incorporated in that country, or (ii) a majority of its shareholding or effective control of the entity is exercised from that country, or (iii) more than 50% of the value of the item being supplied has been added in that country. Indian suppliers shall mean those entities which meets any of these tests with respect to India.

#### 5. Purchase Preference- Linked with Local Content {LC}

5.1 In procurement of all items not covered by para 4.4 (a), the following provisions may be considered for LC linked Purchase Preference:

5.1.1 The manufacturers/ service providers having the capability of meeting/ exceeding the local content targets shall be eligible for purchase preference under the policy, i.e. LC manufacturers/ LC service providers respectively as described below.

5.1.2 Wherever the goods/ services are procured under this policy, eligible (techno- commercially qualified) Class I Local supplier may be granted a purchase preference where the quoted price is within the margin of purchase preference of the lowest price, other things being equal, purchase preference may be granted to the eligible (techno-commercially qualified) Class I Local supplier concerned, at the lowest valid price bid.

**5.1.3 Goods:** The tender for procuring goods would specify that the contract for 50% of the procured quantity would be awarded to the lowest techno-commercially qualified Class I Local supplier, subject to matching with L1, if such bidders are available. The remaining will be awarded to L1.

5.1.3.1 However, if L1 bidder happens to be a Class Local supplier, the entire procurement value shall be awarded to such bidder;

5.1.3.2 If in the opinion of the procuring company, the tenders (procured quantity) cannot be divided in the prescribed ratio of 50:50, then they shall have the right to award contract to the eligible Class I Local supplier for quantity not less than 50%, as may be divisible.

5.1.3.3 In continuation to 5.1.3.2 above, if the tendered item is non divisible, (to be included in the tender document by procuring company) the contract can be awarded to the eligible Class I Local supplier for the entire quantity.

- 5.1.4 **Services/ EPC Contracts:** The tender for oil and gas services/ EPC contracts shall not normally be split. For such procurement the tender would specify that the entire contract would be awarded to the lowest techn-commercially qualified Class I Local supplier, subject to matching with L1, if such bidders are available. However, tender for certain oil & gas services can normally be split, in such cases, splitting shall be allowed and specified in tender document. Such services shall follow the procedure outlined for goods as described in para 5.1.3. The procuring company should clearly specify in the tender document whether the tender shall be split or not.
- 5.1.5 For para 5.1.3 and 5.1.4 above, only those LC manufacturers/ service providers whose bids are within the margin of purchase preference would be allowed an opportunity to match L1 bid.
- 5.1.6 The tender conditions would ensure that local content in oil & gas products is encouraged. However, the procuring company may incorporate such stipulations as may be considered necessary to satisfy themselves of the production capability and product quality of the manufacturer.
- 5.1.7 The procedure for award under the policy is at **Enclosure-I**.

## 6. Determination of LC

### 6.1 LC of goods

- 6.1.1 LC of goods shall be computed on the basis of the cost of domestic components in goods, compared to the whole cost of product.
- 6.1.2 The criteria for determination of the local content cost in the goods shall be as follows:
- a) in the case of direct component (material), based on country of origin;
  - b) in the case of manpower, based on INR component.
- 6.1.3 The calculation of LC of the combination of several kinds of goods shall be based on the ratio of the sum of the multiplication of LC of each of the goods with the acquisition price of each goods to the acquisition price of the combination of goods.

### 6.2 LC of service

- 6.2.1 LC of Service shall be calculated on the basis of the ratio of service cost of domestic component in service to the total cost of service.
- 6.2.2 The total cost of service shall be constituted of the cost spent for rendering of service, covering:
- a) cost of component (material) which is used;
  - b) manpower and consultant cost; cost of working equipment/ facility; and
  - c) general service cost.
- 6.2.3 The criteria for determination of cost of local content in the service shall be as follows:
- a) in the case of material being used to help the provision of service, based on country of origin;
  - b) in the case of manpower and consultant based on INR component of the services contract;
  - c) in the case of working equipment/facility, based on country of origin; and
  - d) in the case of general service cost, based on the criteria as mentioned in clauses a, b, and c above.
  - e) Indian flag vessels in operation as on date.

### **6.3 LC of the EPC Contracts:**

- 6.3.1 LC of EPC contracts shall be the ratio of the whole cost of domestic components in the combination of goods and services to the whole combined cost of goods and services.
- 6.3.2 The whole combined cost of goods and services shall be the cost spent to produce the combination of goods and services, which is incurred on work site. LC of the combination of goods and services shall be counted in every activity of the combination work of goods and services.
- 6.3.3 The spent cost as mentioned in paragraph 6.3.2 shall include production cost in the calculation of LC of goods as mentioned in clause 6.1.1 and service cost in the calculation of LC of services as mentioned in clause 6.2.2.

### **6.4 Calculation of LC and Reporting**

LC shall be calculated on the basis of verifiable data. In the case of data used in the calculation of LC being not verifiable, the value of LC of the said component shall be treated as nil.

## 7 Certification and Verification

7.1 Class I/Class II Local suppliers are eligible to bid only if they meet the local content norms, therefore whether or not they want to avail PP-LC benefit, it will still be mandatory for them to give adequate documentation as follows to establish their status as class-I or class-II local supplier:

7.1.2 At bidding stage:

a) Price Break-up:

- The bidder shall provide the percentage of local content in the bid.

b)

- The bidder shall submit an undertaking from the authorised signatory of bidder having the power of Attorney alongwith the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.
- In cases of procurement for a value in excess of Rs 10 crores, the undertaking submitted by the bidder shall be supported by a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practising chartered accountant (in respect of other than companies) giving the percentage of local content.
- However, in case of foreign bidder, certificate from the statutory auditor or cost auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint statutory auditor or cost auditor, certificate from practising cost accountant or practising chartered accountant giving the percentage of local content is also acceptable.

7.1.3 After Contract Award:

- The bidder shall submit an undertaking from the authorised signatory of bidder having the power of Attorney alongwith the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.
- In cases of procurement for a value in excess of Rs 10 crores, the undertaking submitted by the bidder shall be supported by a certificate



from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practising chartered accountant (in respect of other than companies) giving the percentage of local content.

- However, in case of foreign bidder, certificate from the statutory auditor or cost auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint statutory auditor or cost auditor, certificate from practising cost accountant or practising chartered accountant giving the percentage of local content is also acceptable.

7.2 Each supplier shall provide the necessary local-content documentation to the statutory auditor, which shall review and determine that local content requirements have been met, and issue a local content certificate to that effect on behalf of the bidder, stating the percentage of local content in the good or service measured. The Auditor shall keep all necessary information obtained from suppliers for measurement of Local Content confidential.

7.3 The Local Content certificate shall be submitted along with each invoice raised. However, the % of local content may vary with each invoice while maintaining the overall % of local content for the total work/purchase of the pro-rata local content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would be met in the subsequent stages.

7.4 As regards cases where currency quoted by the bidder is other than Indian Rupee, exchange rate prevailing on the date of notice inviting tender (NIT) shall be considered for the calculation of Local Content.

7.5 The Procuring Company shall also have the authority to audit as well as witness production processes to certify the achievement of the requisite local content.

## **8 Governance and Supervision**

8.1 A Steering Committee will be constituted by MoPNG to provide effective guidance and to oversee the effective implementation of the Policy including review and amendments required therein. The Steering Committee may consider representations on target Local Content in goods, services and EPC and modify the policy accordingly.



- 8.2 The Steering Committee shall annually conduct a review of the policy implementation which shall specifically cover the issue of whether there has been adequate competition, and whether the policy has resulted in any reduction in competition/ exclusion of non-local bidders or any cost increase to the purchasing PSU, particularly in respect of services & works contracts.

## 9 Sanctions

- 9.1 The Procuring companies shall impose sanction on manufacturers/ service providers not fulfilling LC of goods/ services in accordance with the value mentioned in certificate of LC.
- 9.2 The sanctions may be in the form of written warning, financial penalty and blacklisting.
- 9.3 In the event that a manufacturer or supplier of goods and/or provider of services does not fulfil his obligation after the expiration of the period specified in such warning, the procuring company can initiate action for blacklisting such manufacturer/supplier/service provider.
- 9.4 A manufacturer and/or supplier of goods and/or provider of services who has been awarded the contract after availing Purchase Preference is found to have violated the LC provision, in the execution of the procurement contract of goods and/or services shall be subject to financial penalty specified in clause 9.4.1.
- 9.4.1 The financial penalty shall be over and above the PBG value prescribed in the contract and shall not be more than an amount equal to 10% of the Contract Price.
10. **Clarification on Goods/ Services:** Any issue regarding the coverage of a particular good/ service under the proposed policy would be referred to the Steering Committee for clarification.
11. **Powers to grant exemption and to reduce minimum local content:** Wherever proper justification exists, Ministry of Petroleum and Natural Gas may by written order, for reasons to be recorded in writing,  
 a) Reduce the minimum local content below the prescribed level; or  
 b) Reduce the margin of purchase preference below 20%; or  
 c) Exempt any particular item or supplying entities from the operation of

this Order or any part of the Order.

12. **Time Period:** The Policy shall be applicable for 5 years. Except for 2017-18, the Policy shall not be continued unless, the Steering Committee by September 30th of each year, concludes a review as per para 8.2 of the Policy and recommends continuation of the Purchase Preference.

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**Enclosure-I****PROCEDURE FOR AWARD OF CONTRACTS****Procedure for award of contracts under this policy shall be as follows:**

12.1. In procurement of all items which are divisible in nature, the 'Class I local supplier' shall get purchase preference over 'Class II local supplier' as well as 'Non Local Supplier' as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class I local supplier', the contract for full quantity will be awarded to L1.
- ii. If L1 bid is not a 'Class I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, lowest bidder among the 'Class I Local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class I local suppliers, then such balance quantity may also be ordered on the L1 bidder.

12.2. In the procurement of all items which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.
- ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
- iii. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.



**24.0 POLICY FOR PROVIDING PREFERENCE TO INDIAN MANUFACTURED IRON & STEEL PRODUCTS IN GOVERNMENT PROCUREMENT (DMI&SP) -Not applicable**

**25.0 CONTRACT PERFORMANCE BANKGUARANTEE**

The contractor shall within 30 days of receipt of Acceptance of Tender issued by OWNER ,deposit Security Deposit stipulated in clause 2.1.0.0 of GCC part of the tender

**Tender No:3200000590**

**Bidder's Seal & Signature**

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document. However the following paragraphs are appended to the security deposit clause 2.1.1.1 (c) of GCC:

The irrevocable Bank Guarantee (BG) in the prescribed format if submitted against PBG/SD shall be subject to verification from the issuing Bank, the email ID of bank for the same must be incorporated in the BG.

The BG issued by the issuing Bank on behalf of Bidder/Contractor/Supplier in favour of “Mangalore Refinery and Petrochemicals Limited” shall be in paper form and also be made available under the “Structured Financial Messaging System” (SFMS).

A separate advice of the BG will invariably be sent by the issuing bank to the beneficiary’s Bank through SFMS and SFMS transmission message reference number (currently 32digits code) is to be sent along with BG directly to MRPL through speed post/regd. Post.

The details of beneficiary for issue of BG under SFMS platform is furnished below:



**Name of Beneficiary:** Mangalore Refinery and Petrochemicals Limited  
**Beneficiary Bank, Branch and address:** Union Bank of India (Erstwhile Corporation Bank), MRPL Project Site, Kuthethoor Post Mangalore 575030, Karnataka

**IFSC code:** UBIN0905925

**SWIFT Code:** UBININBBMAP

**MICR Code:** 575026018

Any bank guarantee submitted in physical mode which cannot be verifiable through SFMS will not be accepted under any circumstances

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## SPECIAL CONDITIONS OF CONTRACT - PART 2

### 26.0 LOCATION AND ACCESS OF SITE.

The proposed CONSTRUCTION TENDER ON ITEM RATE BASIS FOR PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA as defined elsewhere in the Tender document.

### 27.0 WATER , POWER AND OTHER FACILITIES

#### 27.1 WATER

Clause no. 3.3.0.0 & 3.5.0.0 of G.C.C. shall be modified to the following extent: Construction Water shall not be provided by OWNER.

CONTRACTOR shall be responsible for making all arrangements for construction water at his cost. Any statutory requirements/documentation etc. to this effect shall also be met by the CONTRACTOR.

Non-availability of water due to any reason shall not entitle the CONTRACTOR for any claim against OWNER on account of cost and time implications.



#### 27.2 POWER

Clause no. 3.3.0.0 & 3.4.0.0 of G.C.C. shall be modified to the following extent: Construction Power shall not be provided by OWNER.

CONTRACTOR shall be responsible for making all arrangements for construction Power at his cost. Any statutory requirements/documentation etc. to this effect shall also be met by the CONTRACTOR.

Subject to availability, construction power shall be provided by OWNER on chargeable basis at one point from sub-station(s) near the Works site. Further onward power distribution from above location(s) shall be by the CONTRACTOR at their cost. The construction power shall be made available to the CONTRACTOR subject to grid distribution.



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However, in case OWNER is not able to provide construction power, CONTRACTOR shall be responsible for making all arrangements for construction power at his cost. Any statutory requirements/documentation etc. to this effect shall also be met by the CONTRACTOR. Further, non-availability of construction power or due to any other reasons shall not entitle the CONTRACTOR for any claim against OWNER on account of time and cost implications. Therefore, the CONTRACTOR shall within the contract price make alternative arrangements to cope with such eventuality.

Additional power, if required, to meet the contractual requirements, shall be arranged by the CONTRACTOR at its own cost.

OWNER shall recover the cost of power supply every month at prevailing rate (without prejudice to any other mode of recovery available to OWNER) by deduction from the CONTRACTOR's bills. The energy meter to be installed by the CONTRACTOR shall be tested and certified by State Electricity Board or any other agency approved by OWNER.

## **28.0 LAND FOR SITE OFFICE AND RESIDENTIAL ACCOMMODATION**

CONTRACTOR shall be responsible for making all arrangements for Fabrication yard, Site office and residential accommodation at his own cost. Any statutory requirements/ documentation etc. to this effect shall also be met by the CONTRACTOR.



## **29.0 TEMPORARY WORKS**

29.1 All Temporary and ancillary works including enabling works connected with the work shall be responsibility of the CONTRACTOR and the price quoted by them for erection shall be deemed to have included the cost of such works, which shall be removed by the CONTRACTOR at his cost, immediately after completion of his work.

## **30.0 TIME SCHEDULE**

30.1 The work shall be executed strictly as per Time Schedule provided in ANNEXURE- I to Special Conditions of Contract (SCC) of this Bidding Document.

30.2 CONTRACTOR shall furnish a daily report on category wise labour and equipment deployed along with the progress of work done on previous day in the proforma

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prescribed by the Engineer-in-Charge.

### 31.0 **SCOPE OF WORK**

- 31.1 SCOPE OF CONTRACTOR:** The Scope of work while being detailed is not intended to define each and every individual piece of construction and modification work but provide an overview to the Construction contractor of the scope of work and the main components. This document shall be read in conjunction with the specifications, drawings and other documents included in the bidding document.
- 31.2** The successful bidder i.e. the Construction contractor shall carry out the execution of complete scope of work as per tender document as single point responsibility, He will submit his price bid against this tender. Schedule of Quantities (SOQs) included in this tender document are for the information of bidder for submitting his bid against the tender.

The broad Scope of Works shall include the following:

- a) Project Management and Project Planning
- b) Conduct detailed survey of each equipment identified for modification in documents and drawings and prepare a detailed work plan separately for each & every equipment foundation and structural work submit it to EPCM/Owner
- c) Prepare Mobilization of Construction team - supervisory, skilled and un-skilled man power and share mobilization plan of key personnel based on the detailed surveys
- d) Mobilization of construction machinery / construction equipments and share deployment plan based on the detailed surveys.
- e) Identify scaffolding requirement based on detailed site survey conducted for removal of dismantled material, equipment off-line for modification etc.
- f) Prepare rigging plan for erection and mobilization of cranes of required lifting capacity for removal of existing equipment, installation of new equipment and construction and modification work etc.
- g) Identify the requirement of deck extension(s) as envisaged to carryout dismantling and removal of existing material, modification / fabrication work locally as required.
- h) **Prepare Shop drawings for all structural steel fabrication.**
- i) Supply of bulk material / items
- j) Contractor shall provide necessary barricading of the area of fabrication, construction, and erection for protection and safe installation of facilities complying with HSE requirements of MRPL.
- k) Safety permits clearance from the EPCM Consultant and to meet all the statutory requirement and guide lines of MRPL to obtain the safety and work permit for executing the job. All safety requirements including safety barricading of the area as per the requirement of EPCM/MRPL. HSE team for carrying out the work permit condition shall be provided by the contractor. Obtaining permits / permission from site in-charge EPCM/MRPL for necessary construction, erection and hot work as applicable.
- l) Contractor shall submit P6 schedule for the project as a part of his Planning package within 15 days of award of the project.

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- (o) Contractor shall ensure the progress of work in progress and completed work shall obtain certification / approval from EPCM for the purpose of progress reporting and invoicing.
- (p) Contractor shall provide free furnished Office Space to operate from his Site Office for the Engineers of EPCM & MRPL during execution.

**Comprehensive Scope of Work is as per Document 20005-GEN-CS-SOW-1000/ REV 0**

### 31.3 Construction Power, Water & Construction Machinery / Equipment:

The contractor has to make his own arrangement for construction power however, the power if available, shall be made available to the Contractor from the available nearest sub-station on a chargeable basis at the applicable rates. Installation of required calibrated metering equipment, cables, panel etc. to draw power supply from the substation is in scope of contractor.

If the contractor is making his own arrangement of Power supply through DG Sets, then all safety regulations shall be followed as per Electricity Acts till its latest amendments including CPCB requirements. Contractor shall obtain statutory approvals for DG Sets.

Construction water shall not be provided by OWNER. Contractor to make all the arrangements for Construction water as required for this work at their sole cost and expense including all required statutory approvals required for access of the same.

Contractor shall deploy adequate lifting & material handling equipment, cranes and tools and tackles at site and augment the same depending on exigencies of work to suit the project schedule. Please note that no equipment will be supplied by MRPL.



### 31.4 Project Planning, Scheduling, Monitoring and Control System:

Contractor has to submit software based planning package to EPCM/MRPL in this regard.

31.5 Contractor shall ensure implementation of environmental mitigation measures as per the specifications listed in the contract document as furnished below during the preconstruction and construction period.

- Protection of vegetation
- Run off and erosion control.
- Dust control.
- Air quality control.
- Noise abatement measures.
- Aesthetic enhancement.
- Disposal of construction waste.
- Historical and archaeological protection.

31.5 Contractor shall provide early warning to the EPCM/MRPL about the bottlenecks / hindrance if encountered during execution and suggesting corrective measure to be undertaken by the client.

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31.6 Videos and photographs shall be taken during various construction activities for the review by the EPCM/MRPL and maintain documentation of all the activities of the project. Contractor shall prepare completion reports in compliance with contract documents and obtain approval of the client.

31.7 Contractor shall submit As-built document and drawings, within two months of mechanical completion, based on the approved 'Red Mark-up' prepared by him to reflect the site changes etc.

31.8 Contractor shall ensure and take all the required precautions so that there is no damage to any nearby existing facility whether owned by the Company or a third party.

31.9 Contractor shall be responsible for obtaining necessary approvals / permissions from various regulatory / state / central govt. authorities, municipality gram panchayat related to execution of works under the scope of work. Company's responsibility shall be limited to providing any recommendatory letters.

31.10 The contractor shall follow the safety procedures and norms during the execution of the works within the plant area and comply with all safety regulations as specified by the OWNER/EPCM and as mentioned in the attached HSE plan, accepted industry safety practices and in addition, all statutory/ central/ state government regulations as appropriate for this work. Also LSTK contractor shall follow IOCL Code of Safe Practices.

31.11 Contractor to ensure for adherence of Health, Safety & Environment related issues. Contractor to ensure that safety officer is deployed as per site requirement.

i. Contractor to submit safety procedures in accordance with applicable codes, regulations and Company requirements.



ii Contractor to ensure that necessary precautions are taken to protect construction work and materials from damage by climate and site activities.

iii Contractor to ensure that necessary precautions are taken to protect existing plant & machinery from any possible damage due to construction activity. If necessary area isolation / barricading are to be provided by contractor.

iv. Contractor to obtains necessary approvals and work permits for the construction activities as per requirement.

v. Construction work including supply of labour, equipment, consumables, temporary facilities and materials and various supporting Works. Construction waste management should comply with IOCL's procedures and regulations.

vi. Contractor to arrange for safe disposal of hydro-test water.

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### 31.12 SPECIFIC WARNING SIGNS AND OPERATING INSTRUCTIONS

The Contractor is required to install special notices in English, Hindi and Local Language and signage on the entire facility and on vessels and equipment as noted below: -

- a. Necessary safety precautions at strategic locations.
- b. 'NO SMOKING' signs at / near strategic locations viz. building module, wells etc.



### 31.13 REMOVAL OF WASTE

It shall be Contractor's responsibility to remove & dispose all Construction Equipment, sludge, dismantled equipment / pipes / valves etc. and waste materials from site on completion of the Works and reinstate the site / facilities complying with MRPL's procedures and regulations.

### 31.14 TEMPORARY FACILITIES

The temporary facilities under the Contractor's scope shall include, but not limited to the following:

- a. Security gate and gate house for his site facilities
- b. Security fences
- c. Material lay-down area (lay down area will be provided inside premises close to the unit. Exact location of lay down area will be decided after award of contract)
- d. Storage & Ware House for Free Issue Material and bulk material /items
- e. Ware house facilities for various construction items, including air-conditioned storage if required.
- f. Contractor's site offices
- g. Office space for EPCM & MRPL construction supervision team deployed.
- h. Workshop facilities
- i. Fabrication areas including shot blasting and painting areas
- j. Maintenance facilities for all mobilized equipment and heavy vehicles.
- k. Batching plant and aggregate storage outside MRPL premises
- l. Construction water receipt, storage and distribution
- m. Temporary drainage systems including that for heavy rains in monsoon

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- n. Labourer camps outside MRPL premises
- o. Required any other facilities for construction labourers outside MRPL premises
- p. Laboratory for field testing of civil/structural items
- q. Construction of barricading during construction period and removal of the same after construction is over.
- r. Provision like covered shed to work in Monsoon

Contractor scope of work also includes providing of temporary power supply, water and other utilities required for fabrication, construction, office facilities etc. during execution till completion of project and its associated facilities as defined in specification and drawings.

Any other work not specifically mentioned above but required to complete the work in all respects as per tender specifications drawings and instruction of Engineer-in-charge and also to result in an fully operable and maintainable plant.

The scope of work as described above shall be supplementary to the scope of work mentioned under various parts of bidding document.

### 31.15 OWNER'S INSTRUCTION

The Contractor shall carry out and complete the said work in every respect in accordance with this contract and with the direction of and to the satisfaction of the Owner.

The Contractor shall follow Owner's Instructions" in regard to:



- The removal from the site of any materials brought thereon by the Contractor and the substitution of any other material therefore.
- The removal and/or re-execution of any works executed by the Contractor.
- The dismissal from the works of any persons employed thereupon.
- The opening up of inspection of any work covered up.
- The amending and making good of any defects.

#### 31.15.1 Definition of Completion and Acceptance

Completion is the condition achieved when:

- a. The facility has been erected in accordance with relevant drawings,



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documents, specifications, instructions and applicable codes and regulations, safety standards.

- b. Ensure Liquidation of all punch lists provided by the MRPL.
- c. The work detailed in scope of contract is completed.
- d. All the deficiencies that could prevent safe and orderly commissioning activities have been rectified.
- e. ~~All electrical activities are completed.~~

### 31.15.2 Work Program

Contractor with immediate effect from the date of Contract shall furnish site organogram & Mobilisation Plan for all the Execution Centres including a detailed Work Program showing how contractor shall perform the Work in accordance with the Time Schedule of Work (incorporating but not limited to all Milestones and Milestone Tasks in order to complete the work within the specified time). The project schedule shall be drawn in such a manner that it meets the requirement of MRPL. The project shall be monitored based on a schedule date of completion.

MRPL and CONTRACTOR shall there after settle such work program and such settled program

signed on behalf of the MRPL and CONTRACTOR shall constitute “Time Schedule of Work” or



“Schedule of Work” for the purpose of the Contract. To complete the job as per schedule contractor shall mobilize additional manpower based on the actual requirement at contractor cost.

### 31.15.3 SCOPE OF SUPPLY

The scope of supply is as mentioned in Schedule of Rates, etc., of Bidding Document. All materials, equipment’s, labour & consumables etc. whatsoever required for successful completion of work as per the description of item in Schedule of Rates shall be supplied by the CONTRACTOR and the cost of such supply shall be deemed to be included in the quoted rates without any additional liability on the part of OWNER.



## 32 SPECIAL NOTES

- a. The prices quoted in the tender shall include all charges for cleaning of site before commencement as well as after completion, water, electric consumption, scaffolding,

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centering, staging, planking, timbering, and pumping out water including fencing, plant and equipment storage sheds, watching and lighting by night as well as day, temporary plumbing and electric supply, and the contractor shall as occasion shall require or when ordered to do so, reinstate and make good, all matters and things disturbed during the execution of the work, to the satisfaction of the PMC/OWNER. The rate quoted shall be deemed to be for the finished work to be measured at site.

- b. The successful bidder shall make his own arrangement to obtain all materials required for the work as stated in the technical specification.
- c. If the contract work or any portion thereof at any time before the expiry of defect liability period be found defective or fails to fulfill the requirements, PMC/OWNER shall give Contractor notice in writing setting forth particulars of such defects or failure and contractor shall forthwith make good such defects or replace or alter to make it comply with the requirements. Any materials, equipment's, etc. brought to site and found to be not in accordance with the specification shall be rejected and the Contractor shall remove the materials from the site within the time specified by PMC/OWNER. The contractor shall not be entitled for any extension of time or extra cost for rejection.
- d. The contractor shall strictly follow the safety code and also the instructions issued by the Safety department from time to time. Before starting the work, the contractor shall meet the EIC Safety Engineer and get himself familiar with the safety measures to be taken during execution of the job. The contractor shall be personally responsible for the safety of his workmen and shall be liable for prosecution in case of any accident.
- e. All statutory approvals required from Factory Inspectorate, PESO, PCB, Electrical Inspectorate including permanent power supply, road cutting, forest clearance, panchayat /municipality clearance, clearances from district administration etc. shall be ensured by the CONTRACTOR. Owner may provide necessary signed papers as required for such clearance. The statutory fees as applicable shall be borne by the CONTRACTOR. The CONTRACTOR shall arrange for the inspection of the works by the authorities and will undertake necessary coordination and liaison as required and shall not be entitled to any extension of time for any delay in obtaining such approvals.
- f. The Contractor shall provide and maintain proper temporary sheds of adequate capacity for storage of all materials, free issue items and his own store in good and



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water tight conditions at site. Any damage / loss of materials in the Contractor's custody will be to his account and will be recovered from his running bills.



- g. The quoted price shall be inclusive of any temporary approach, dewatering arrangement and any other items as required for execution of the work. Contractor shall take adequate precautions to avoid blocking of nearby natural drains.
- h. Contractor shall follow safe work practice considering the Underground Hydrocarbon pipelines that are passing at the vicinity of the work site (appr 50 mtr). It is expected that other agencies may also work simultaneously close to the work site and bidder to coordinate with other agencies so as complete the work within the schedule.
- i. Price variation clause is applicable for this tender.
- j. As per the Security Guidelines issued by Ministry of Home Affairs (MFA), Government of India, verification of Character & Antecedents (Police verification) in respect of all personnel working in Refineries is mandatory. The Contractor shall submit Police Verification Report of the workmen employed under them. Submission of Police verification Report to MRPL is compulsory for issue of fresh passes to work in Plant Process Areas and other sensitive jobs in Non-Plant areas of MRPL.
- k. The Contractor shall submit Security Deposit (SD)/Performance Bank Guarantee(PBG) as per GCC clause 2.1.0.0

### 33 MISCELLANEOUS

- a. Contractor shall be responsible for the safety and health of all his employees.
- b. The contractor shall abide by all safety regulations of the plant/ work environment/ worksite and ensure safety as stipulated in Factories Act safety, HSE specification, OISD and other requirements followed in totality by MRPL.
- c. Contractor shall ensure strictly all Safety Precautions to be taken in an Operating Refinery. "Special safety precautions to be taken by the contractors working in operating refinery" is to be taken from Engineer-in-charge.
- d. Suitable action shall be taken on violation of safety rules/prohibited activities/malpractices as per MRPL code of conduct.
- e. Contractor shall ensure that all workmen entering refinery premises are provided with valid photo gate passes and to be produced on demand by each workman.

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- f. The Contractor shall submit the Bio-data of all the employees including the Supervisor to the Engineer-in-charge before taking up the job. Only those employees who's Bio-data are approved shall be allowed to work inside the Refinery Complex. The personnel engaged by the Contractor shall maintain good conduct and discipline commensurate with Industrial standard. If in the opinion of the Engineer-in-charge any of the personnel have not maintained good conduct and discipline, the Contractor shall remove such personnel immediately from MRPL premises and provide alternate personnel.
- g. The Contractor shall make his own transport arrangements/stay and food for their personnel during normal duties as well as extended duties and no company transport shall be provided to the Contractor.
- h. The Contractor shall make himself fully conversant with the locations and the type of job to be carried out.
- i. Housekeeping of the workplace shall be done strictly by the Contractor on daily basis or as required by the Engineer-in-charge. Contractor to collect all debris/ scrap and dump at designated Scrap Yard within the Refinery.
- j. The Contractor shall prepare plan for executions of jobs and get the same approved by the Engineer-in-charge. The Contractor shall submit progress report at specified intervals and shall be responsible to ensure the specified progress.
- k. The Contractor shall ensure that day's work planned by MRPL Engineer-in-charge is completed on the same day. In case of backlog, the Contractor to increase the manpower or equipment resources to ensure timely completion of the job.
- l. Blasting will not be permitted inside the unit working area.
- m. The Contractor shall ensure good workman-ship in all the jobs carried out. Any defects found in the completed jobs shall be rectified by the Contractor free of charge to the satisfaction of the Engineer-in-charge.
- n. If at any stage of the work, the progress of the Job is found unsatisfactory, MRPL reserves the right to carry out the remaining portion of the Job by hiring the services of the other agencies and charge the cost of such services to Contractor's account. In case of any disputes MRPL's decision will be final & binding.

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- o. The work to be carried out in a manner so as not to cause damage to the surroundings. Damage if caused during carrying out the Job has to be made good by the Contractor at no extra cost to MRPL.
- p. No Extra Bill or Claim for extra work or supply of material will be entertained unless undertaking of such extra work/supply of material has been authorized by MRPL in writing.
- q. MRPL reserves the right to terminate the Contract without assigning any reason at any time during the validity of the Contract period.
- r. Monthly RA Bills shall be submitted to Accounts Dept. on any working day duly certified by the Engineer-in-charge after completion of work.
- s. MRPL reserves the right to award the job in full or in any combination of the items as felt convenient.
- t. Contractor to perform / arrange resources to execute the assigned civil jobs other than BOQ items depending on the work requirement within the stipulated time frame as per the directions of EIC.

### 34 SITE CLEANING

- 34.1 The CONTRACTOR shall clean and keep clean the work site from time to time to the satisfaction of the Engineer- in-Charge for easy access to work site and to ensure safe passage, movement and working.
- 34.2 If the work involves dismantling of any existing structure in whole or part, care shall be taken to limit the dismantling upto the exact point and/or lines as directed by the Engineer-in-Charge and any damage caused to the existing structure beyond the said line or point shall be repaired and restored to the original condition at the CONTRACTOR's cost and risks to the satisfaction of the Engineer-in-Charge, whose decision shall be final and binding upon the CONTRACTOR.
- 34.3 The CONTRACTOR shall be the custodian of the dismantled materials till the Engineer-in- Charge takes charge thereof.
- 34.4 The CONTRACTOR shall dispose off the unserviceable materials, debris etc. To area within OWNER's Refinery premises / other area as directed by the Engineer-in-Charge.

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34.5 The CONTRACTOR shall sort out, clear and stack the serviceable materials obtained from the dismantling/ renewal at places as directed by the Engineer-in-Charge.

The rates quoted in SOR are deemed to be inclusive of all the costs required for successful completion of works including costs towards all the above activities. No extra claim, whatsoever, shall be entertained.

### 35 **MEASUREMENT OF WORKS**

35.1 For all payment purposes, measurement shall be as set out in **ANNEXURE- II to SCC**.

### 36 **TERMS OF PAYMENTS**

36.1 The basis and terms of payments for various items of Schedule of Rates, for making "On Account Payments" shall be as set out in **ANNEXURE- III to SCC**.



### 37 **ROUNDING OFF**

37.1 All payments to and recoveries from the CONTRACTOR's bills shall be rounded off to the nearest Rupee. Wherever the amount to be paid/recovered consists of a fraction of a Rupee (Paise), the amount shall be rounded off to the next higher rupee if the fraction consists of 50 (fifty) paise or more and if the fraction of a Rupee is less than 50 (fifty) paise, the same shall be ignored.

### 38 **BUILDING AND OTHER CONSTRUCTION WORKER'S ACT**

- a. In order to govern welfare and working conditions of laborers engaged in construction activities, the Building and other Construction Workers' (Regulation of Employment and Conditions of Service "RE &CS") Act, 1996 came into force. RE&CS Act'1996 is applicable in respect of building and other construction work. The CONTRACTOR shall strictly comply with the following provisions pertaining to RE &CS Act'1996.
- b. The CONTRACTOR shall be responsible to comply with all provisions of the Building and Other Construction Workers' (RE&CS) Act, 1996, the Building and Other Construction Workers' Welfare Cess Act, 1996, the Building and other Construction Workers' (RE&CS) Rules, 1998 and the Building and Other Construction Workers Welfare Cess Rules, 1998.
- c. BOCW Cess at the prevailing rate, if applicable, shall be remitted to the "Secretary, Building and Other Construction Workers Welfare Board" of the concerned State by the Contractor. The same shall be reimbursed to the



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Contractor by OWNER, based on the submission of the proof of payment

**39.0 DELETED**

**40.0 CONTRACTOR'S LABOURERS TO LEAVE SITE ON COMPLETION OF THE WORK**

The Labourers of Contractor must leave the location of the refinery/township/project site after the work is tapered off/completed.

**41.0 FUEL REQUIREMENT OF WORKERS**

The CONTRACTOR shall be responsible to arrange for the fuel requirement of his workers and staff without resorting to cutting of trees, shrubs etc. Cutting of trees, shrubs etc is strictly prohibited for this purpose.

**42.0 TRANSPORTATION :**

Contractor shall be responsible to arrange transportation (to and fro) to MRPL for his workforce at his own cost.

**43.0 PUTTING UP OF BUILDINGS ON PROJECT SITE (If applicable) :**

The contractor shall put up temporary structures as required by him for his office fabrication shop and stores only on the area allocated to him on the Project Site. No tea stalls/canteens should be put up or allowed to be put up by contractor in plant area without written permission of the owner.

No Person other than authorised watchman shall be allowed to stay in the plant area after



completion of the day's work without prior written permission of the Engineer-in-charge.

**44.0 ENTRY PASSES, GATE PASSES, WORK PERMITS AND SAFETY REGULATIONS**

As such, CONTRACTOR is required to abide by safety and security regulations of OWNER enforced from time to time.

**44.1 ENTRY PASSES**

The CONTRACTOR has to apply for photo entry passes for his workers & staff in a prescribed proforma available with OWNER, for entry into MRPL premises . The photo entry passes shall be issued by OWNER for a maximum period of 4 months and if extension is required by the CONTRACTOR, he has to apply separately for extension. As a special case temporary passes for a maximum period of 7 days may be issued. Unutilized/ Expired entry passes shall have to be submitted immediately to OWNER.

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In case of loss of any entry pass, the CONTRACTOR has to lodge FIR with local police station and inform the Engineer-in-charge and shall have to pay Rs. 150/- against each entry pass. The CONTRACTOR is required to keep track of all entry passes issued and returned.

Identity card issued by the Security Section should always be carried/ displayed by the CONTRACTOR's employee or person while working inside the Plant.

#### 44.2 **GATE PASSES**



To bring materials/ equipments/ tools/ tackles etc. inside the plant for construction work, the CONTRACTOR has to produce challans/ proper documents to OWNER/ 's personnel at gate. The materials shall be checked thoroughly by OWNER's personnel at Gate and recorded in their register before allowing any material to bring inside the plant by CONTRACTOR. It is CONTRACTOR's responsibility to see that the recorded entry no., date, signature of OWNER/ authorised representative with stamp challans/ supporting documents signed by company's personnel at gate during entry.

#### 44.3 **WORK PERMIT**

When the work is to be carried out in hazardous areas, hot work permit are to be obtained before start of work for all the jobs which are capable of generating flame, spark, heat etc. namely, Gas cutting, grinding, welding, use of any electrical/ diesel/ petrol/ battery operated prime mover/ machine/ tools/ equipment/ generator sets/ mixer machine/ drilling machine/ pumps/crane, fork lifter/ hand truck/ trailer, chipping/ breaking of rocks/concrete, hacksaw cutting and drilling, etc.

Cold work permits are to be obtained for the jobs which are not coming under the category of hot work and where there is no risk of fire, viz, transportation/ backfilling of ordinary soil in manual process, piling testing, hydro testing, shuttering, fixing of reinforcement, hand mix concreting, plastering, brick work etc.

According to nature of work and use of various types of equipment's& tools the CONTRACTOR has to apply for cold/hot permits in a prescribed format at least 2 days before the work is planned to start. No work permit shall be issued by OWNER unless proper arrangement is made by the CONTRACTOR to ensure safe performance of work inside the plant. Job wise and area wise permits shall be issued to the CONTRACTOR and against each permit at least one construction supervisor and one safety supervisor

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of required level shall always be made available at site by the CONTRACTOR. These safety permits shall be issued at one point contact by OWNER.

Whenever excavation has to be carried out within Refinery Premises, applicable Permit as per MRPL procedure shall be obtained from OWNER before start of job.

CONTRACTOR shall arrange for Cable tracker and Pipe Tracker for locating UG facilities, wherever required.

#### 44.4 **VEHICLE PERMIT**

Permits are to be obtained separately for entry/use of vehicles/ trailers etc. inside the plant. The following requirements are to be met to obtain vehicle permit:

- i) Vehicle/Equipment etc. should be brought to site in good conditions.
- ii) Valid Road tax certificate, fitness certificate and insurance policy from competent authority.
- iii) Valid operating/ driving licence of driver/operator.



#### 44.5 **VALIDITY OF THE WORK PERMIT**

- i) Permit is valid for 24 hours.
- ii) No permit is valid if it is not renewed by the shift incharge/ shift representative in shifts (Morning & Evening)
- iii) The permit shall be issued for a maximum period of one month and if extension is required, the CONTRACTOR has to apply for fresh permit.
- iv) No permit is valid on holidays unless special permission is obtained from the competent authority.
- v) For works in the operational areas, Contractor shall follow MRPL work permit system.

#### 44.6 **SAFETY REGULATIONS**

##### **Regarding work Permit**

- i) The work shall be carried out inside the plant as per safety practices enforced by OWNER's safety section and instructions of Engineer-in-charge issued from time to time. Many times it may happen that the working hours shall be drastically reduced or increased to meet certain safety requirements and the CONTRACTOR shall meet these requirements without any argument for time and financial implications. To obtain work permit and to satisfy all conditions laid down therein, shall be the responsibility of the CONTRACTOR. No claim for idling of machinery, plant, manpower etc. for safety reasons or non-issuance of work permit by In-charge, Safety Section

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shall be considered.

- ii) The CONTRACTOR shall abide by all safety regulations of the plant and ensure that safety equipment for specific job kit as stipulated in the factory act/ safety handbook is issued to the employee during the execution of work, failing which all the works at site shall be suspended.
- iii) The Contractor must put in place a Lock-Out Tag-Out system to ensure electrical safety with all warning signs and safe procedure.

#### **Regarding Hot work**



- i) When doing hot work inside the plant the CONTRACTOR must ensure that the fire hose is hooked up with the fire water system and extended to the work spot. Fire extinguisher must be kept near the working spot. Area around and below the hot working place must be adequately protected from falling/ coming out of sparks/hot metals from the booth made of asbestos cloth/sheet and wetting them with water. The CONTRACTOR must arrange sufficient number of fire hoses and fire fighting equipment of approved quality at his own cost to carry out hot job inside the plant.
- ii) Welding & electrical cables should be of approved quality, and no jointing and loose connection shall be permitted.
- iii) At the end of the working day the CONTRACTOR must inform electrical section to switch off power at sub-station end.
- iv) The CONTRACTOR must provide cotton dress, safety shoe, safety helmet, safety belt, hand gloves of approved quality to his workers to meet the safety requirement of various jobs to be carried out inside the plant.

#### **Regarding use of Vehicle**

- i) Vehicle must not ply on any road within the MRPL plant at speed exceeding 20KM/hr.
- ii) Mobile crane/ loaded trucks/ trailers must not exceed speed limit of 15 KM/hr inside the plant.
- iii) No crane is allowed to move inside the plant with load.
- iv) No vehicle is allowed to park inside the plant.



### **45.0 HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT**

- 45.1 Safety is to be given prime importance. During construction CONTRACTOR shall strictly follow the safety procedures, precautions, norms laid down by OWNER. In case of non-

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compliance, Engineer-in-Charge shall give notice to the Contractor. In case of repeated failure of the Contractor, Engineer-in-Charge is free to take actions such as withholding of bills, heavy penalty etc. The quantum of such actions will be decided by the Engineer-in-Charge.

- 45.2 Bidder shall include in his offer the Health, Safety and Environment (HSE) Management and procedures which is required to be adhered to during the execution of contract. After the award of the contract, detailed Health, Safety and Environment (HSE) programme to be followed for execution of contract under various divisions of works will be mutually discussed and agreed to.
- 45.3 The CONTRACTOR shall establish document and maintain an effective Health, Safety and Environment (HSE) management system.
- 45.4 In case CONTRACTOR fails to follow the instructions of Engineer-in-charge with respect to above clauses, next payment due to him shall not be released unless until he complies with the instructions to the full satisfaction of Engineer-in-charge.
- 45.5 The Contractor shall also adhere to the requirements of OWNER specifications on Safety, enclosed as Annexure- VIII to this SCC.
- 46.0 SAFETY NORMS**
- 46.1 In addition to price reduction and deductions as provided for in the Contract, the OWNER shall be entitled to deduct from any payment due to the CONTRACTOR, for violations of safety provisions, as per details given below:
- 46.2 Violation of applicable safety, health and environment related norm, a price reduction of Rs.5000/- per occasion.
- 46.3 Violation as above resulting in:
- a. Any physical injury - a price reduction of 0.5% of the work order value (maximum of Rs.2,00,000) per injury in addition to Rs.5,000/-.
  - b. Fatal accident - a price reduction of 1% of the work order value (maximum of Rs.10,00,000) per fatality in addition to Rs.5,000/-.
- 46.4 The CONTRACTOR shall be required to take a suitable Insurance Policy with a view to cover themselves against the above penalties and submit a copy of the said policy to the Engineer-in-Charge before possession of site is given to them.
- 46.5 Safety is to be given prime importance. During construction Contractor shall strictly follow the safety procedures, precautions, norms laid down by MRPL. In case of non-

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compliance, Engineer-In-Charge shall give notice to the Contractor. In case of repeated failure of the Contractor, Engineer- In- Charge is free to take actions such as withholding of bills, heavy penalty etc. The quantum of such actions will be decided by the Engineer- In- Charge.

- 46.6 Contractors are required to meet all safety requirement of MRPL and work shall be carried out with working permit system of MRPL
- 46.7 Contractors shall provide Personal Protective Equipment like Safety Helmets as per IS2925, Safety shoes as per IS15298, Safety Belts as per IS3521 or EN361, Fullbody Harness as per IS3521 or EN361, Hand Gloves etc. for safe job execution. Rainy shoes, Raincoats shall be mobilized by Contractor for their work force to carry out the jobs during rainy seasons. Relevant documentary evidence like MRPL materials entry gatepass for above items shall be submitted to EIC.
- 46.8 Scaffolding as per CPWD specification, as required for the proper execution of the work shall be erected. Jhoola or ladder shall not be permitted. Any height work will be carried out by using scaffolding with MS jali platform with certification of owner.

**47.0 ADDITIONAL CLAUSES FOR CONTRACTOR:**

47.1 Usage of hydra at construction site for lifting and shifting of materials is prohibited.



47.2 Clause 3.2.0.0 of GCC is further modified additionally as follows:

Contractor to maintain a separate warehouse/yard at the project Site for storing his own supplied materials. Contractor shall take delivery of free-issue items from Owner's warehouse / yard. Contractor to arrange his own crane, handling equipment and required resources to load / unload from the truck and store free-issue material. All preservation of installed and un-installed free-issue and other material is in the scope of Contractor. Full care and custody and control of free - issue material shall be the responsibility of the Contractor after material issue at Owners warehouse/yard.

**48.0 STATUTORY APPROVALS**

The approval from any authority required as per statutory rules and regulations of Central/State Government shall be the CONTRACTOR's responsibility unless otherwise specified in the Bidding document. The application on behalf of OWNER for submission to relevant authorities along with copies of required certificate complete in all respects



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shall be prepared and submitted by the CONTRACTOR well ahead of time so that the actual construction/commissioning of the work is not delayed for want of the approval/inspection by concerned authorities. The inspection of the works by the authorities shall be arranged by the CONTRACTOR and necessary coordination and liaison work in this respect shall be the responsibility of the CONTRACTOR. Reimbursement of Statutory fees paid by CONTRACTOR (as per advance approval of OWNER) may be provided for, subject to submission of receipt.

Any change/addition required to be made to meet the requirements of the statutory authorities shall be carried out by the CONTRACTOR within the quoted price. The inspection and acceptance of the work by statutory authorities shall however, not absolve the CONTRACTOR from any of his responsibilities under this contract.

Subject to provisions of the General Conditions of Contract, the inspection and tests as required under Indian Electricity Rules-1956 and prescribed in I.S.732 (Part-III) - 1982 shall be conducted.

All tests clearances and certificates required by the State Government authorities for energizing / commissioning the electrical system laid by the Contractor shall be obtained by the Contractor at his costs and initiative, for which the Contractor shall perform such tests and undertake such rectification and/ or changes as may be required.



The CONTRACTOR shall have a valid electrical contractor's license for working in the State where the site is located. The Contractor shall furnish a copy of the same to Engineer-in- Charge before commencement of any electrical work or work pertaining to Electrical System. No electrical work or work pertaining to electrical system(s) shall be permitted to be executed without a valid Electrical Contractors License being produced by the CONTRACTOR.

#### **49.0 RENTS & ROYALTIES**

49.1 Unless otherwise specified, the CONTRACTOR shall pay all tonnage and other royalties, rents and other payments or compensation (if any) for getting stone, Sand, gravel, clay, bricks or other materials required for the works or any temporary works. Contractor has to submit the challan paid for all the relevant materials explained above, failing which equivalent amount towards Royalty will be withheld from the bills of contractor.

All royalties etc., as may be required for any Borrow Areas including right of way et. to be arranged by Contractor shall be deemed to have been included in the quoted prices.

Contractor's quoted rate should include the royalty on different applicable items as

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per the prevailing State Government rates. In case, owner is able to obtain the exemption of Royalty from

the State Government, the Contractor shall pass on the same to owner for all the items involving Royalty. Any increase in prevailing rate of Royalty shall be borne by the Contractor at no extra cost to the Owner. The contractor should indicate the rate of Royalty considered in their offer.

#### **50.0 RESPONSIBILITY OF CONTRACTOR**



It shall be the responsibility of the CONTRACTOR to obtain the approval for any revision and/or modifications decided by the CONTRACTOR from OWNER/ Engineer-in-Charge before implementation. Also such revisions and/or modifications if accepted/ approved by OWNER/ Engineer-in-Charge shall be carried out at no extra cost to OWNER. Any change required during functional requirements or for efficient running of system, keeping the basic parameters unchanged and which has not been indicated by the CONTRACTOR in the data/drawings furnished along with the offer will be carried out by the CONTRACTOR at no extra cost to OWNER.

All expenses towards mobilisation at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.

It shall be entirely the CONTRACTOR's responsibility to provide, operate and maintain all necessary construction equipment, steel scaffoldings and safety gadgets, cranes/derrick and other lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all the jobs as per time schedules.

Preparing approaches and working area for the movement and operation of the cranes, levelling the areas for assembly and erection shall also be responsibility of the CONTRACTOR. The CONTRACTOR shall acquaint himself with access availability facilities, such as railway siding, local labour etc., to provide suitable allowances in his quotation. The CONTRACTOR may have to build temporary access roads to aid his own work, which shall also be taken care of while quoting for the work.

The procurement and supply in sequence and at the appropriate time of all equipment's/materials and consumables shall be entirely the CONTRACTOR's responsibility and his rates for execution of work will be inclusive of supply of all these items.

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## 51.0 SITE ORGANISATION

The CONTRACTOR shall without prejudice to his overall responsibilities and liabilities to provide adequate qualified and skilled personnel on the work, in line with details indicated as **ANNEXURE- IV to SCC** shall deploy site organization and augment the same as decided by the Engineer-in-Charge depending on the exigencies of work. Qualification and Experience of key construction personnel shall be as per **ANNEXURE-IV to SCC**. In addition to this CONTRACTOR shall deploy Safety Supervisors to ensure safer working conditions at site. In case where the works are Sub-Contracted by the main CONTRACTORS, Safety Supervisors are to be provided by the main CONTRACTOR.

### a. Contractor's Field workers

The contractor shall provide, to the satisfaction of the EIC sufficient and competent work force in respective civil and other works. It is the responsibility of the contractor to take necessary work permits to carry out the job in plant area as per MRPL work permit system.



## 52.0 SURPLUS MATERIALS

Surplus Civil Construction materials comprising sand, bricks, stones, reinforcement steel and aggregate and the products of dismantling temporary works erected by the CONTRACTOR shall vest in and belong to the CONTRACTOR upon completion of the works and/ or earlier termination of the contract for any cause, with right in the CONTRACTOR, subject to the other terms & conditions of the contract, to remove the same from the job site subject to satisfactory proof of supply. No other surplus material will be allowed to be taken out and deemed to be the property of OWNER and the same shall be transported properly to OWNER's store or as directed by OWNER. Accordingly quoted prices shall be deemed to be inclusive of the same.

## 53.0 QUALITY MANAGEMENT SYSTEM

The CONTRACTOR shall adhere to the quality assurance system as per OWNER Specification enclosed as per **ANNEXURE-V** to SCC. After the award of the contract, detailed quality assurance programme to be followed for the execution of contract shall be submitted by CONTRACTOR.

The CONTRACTOR shall establish document and maintain an effective quality assurance

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system as outlined in recognized codes.

Quality Assurance Management plans/procedures of the CONTRACTOR shall be furnished in the form of a QA manual. This document should cover details of the personnel responsible for the quality assurance, plans or procedures to be followed for quality control in respect of Design, Engineering, Procurement, Supply, Installation, Testing and Commissioning. The quality assurance system should indicate organizational approach for quality control and quality assurance of the construction activities, at all stages of work at site as well as at manufacturer's works and dispatch of materials.

The OWNER or their representative shall reserve the right to inspect/ witness, review any or all stages of work at shop/site as deemed necessary for quality assurance.

The CONTRACTOR has to ensure the deployment of quality Assurance and Quality Control Engineer(s) depending upon the quantum of work. This QA/QC group shall be fully responsible to carry out the work as per standards and all code requirements. In case OWNER/Engineer-in-charge feels that CONTRACTOR's QA/QC Engineer(s) are incompetent or insufficient, CONTRACTOR has to deploy other experienced Engineer(s) as per site requirement and to the full satisfaction of OWNER/Engineer-in-charge.



In case CONTRACTOR fails to follow the instructions of OWNER with respect to above clauses, next payment due to him shall not be released unless until he complies with the instructions to the full satisfaction of OWNER.

#### 54.0 **SETTING OUT OF WORK**

OWNER shall furnish the relevant existing grid point with Bench Mark, on the land. It shall be CONTRACTOR'S responsibility to set out the necessary control points in and to set out the alignment of the various works. The CONTRACTOR shall employ an efficient survey team for this purpose and the accuracy of such setting out works shall be the CONTRACTOR'S responsibility.

The CONTRACTOR shall give the Engineer-in-Charge not less than 24 (Twenty four) hours' notice writing of his intention to set out or give levels for any part of the work so that arrangements may be made for checking the same.

Work shall be scheduled so as to enable checking lines and levels on any part of the work. The CONTRACTOR shall within the scope of work provide all assistance, tools, gauges and instruments required to enable the Engineer-in-Charge to check the setting out of works.

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## 55.0 UNDERGROUND AND OVERHEAD STRUCTURES

OWNER/ Engineer-in- Charge shall provide, to the best possible extent, details in respect of existing structures, overhead lines, existing pipelines and utilities existing at job site to the CONTRACTOR. The CONTRACTOR shall execute the work in such a manner that the said structures, utilities, pipelines etc. are not disturbed or damaged, and shall indemnify and keep indemnified OWNER/ Engineer- in-Charge from and against any destruction thereof or damages thereto. Moreover, CONTRACTOR shall prepare drawing showing all the above stated details accurately and submit to Engineer-in-Charge. No extra payment shall be made on this account. The prices quoted in SOP/ SOR are deemed to be inclusive of the costs towards this activity as well.

## 56.0 DISTINCTION BETWEEN SUBSTRUCTURE AND SUPERSTRUCTURE

To distinguish between work in substructure and superstructures, the following criteria shall apply:

For all equipments pedestals, pipe racks, other foundations and RCC structures, work done up to 300mm level above Highest Pavement Point/Finished Floor Level will be taken work in sub- structure and work above this level will be treated as work in superstructures.



For Buildings only, all works up to level corresponding to finished floor level (Ground Floor) shall be treated as work in “Substructure” and all works above the finished floor level shall be treated as “Work in Superstructure”.

Irrespective of what has been stated above, all pavements, RCC retaining wall, all pipe sleepers and any similar item would be taken as work done in substructure irrespective of locations nomenclature, and levels given anywhere. Where not specifically pointed out all works in sumps, drains manholes, tank pads, cable trenches or such similar items would be taken as work in substructure.

## 57.0 COORDINATION WITH OTHER AGENCIES

CONTRACTOR shall be responsible for proper coordination with other agencies operating at the site of work so that work may be carried out concurrently, without any hindrance to others. The Engineer-in-Charge shall resolve disputes, if any, in this regard, and his decision shall be final and binding on the CONTRACTOR.

If and when required for the coordination of the works with other agencies involved at site, the CONTRACTOR shall within the scope of work, re-route and/or prepare

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approaches and working areas as may be necessary.

## 58.0 CONSTRUCTION

The CONTRACTOR shall within the scope of work observe in addition to specifications, all national and local laws, ordinances, rules and regulation and requirements pertaining to the work. Various procedures and methods to be adopted by CONTRACTOR during the construction as required in the respective specifications shall be submitted to OWNER in due time and well in advance of the specific work for approval.

The CONTRACTOR shall carry out required supervision as per Quality Assurance Plan and furnish all assistance required by OWNER in carrying out inspection work. OWNER will have authorized representatives present who shall have free access to the work at all times. If an OWNER representative notifies the CONTRACTOR'S representative of any deficiency in any work or in the supervision thereof, the CONTRACTOR shall make every effort to carry out such instructions consistent with best industry practice.



## 59.0 GENERAL GUIDELINES DURING AND BEFORE ERECTION

The CONTRACTOR shall be responsible for organizing the lifting of the equipment in the proper sequence for orderly progress of the work and to ensure that access routes for erecting the other equipments are kept open.

Orientation of all foundations, elevations, lengths and disposition of anchor bolts and diameter of holes in the supports and saddles shall be checked by the CONTRACTOR well in advance of the installation. Rectifications, including chipping of foundations, shall be carried out where necessary in consultation with the Engineer-in-Charge. If a structural member needs to be dismantled to facilitate the equipment erection, this shall be done by the CONTRACTOR after ensuring proper stability of the main structure in consultation with the Engineer-in-Charge. All such dismantled members shall be put back in position to the satisfaction of Engineer-in-Charge after the completion of the equipment erection.

During the performance of the work the CONTRACTOR shall at his own cost keep structures, materials and equipment adequately braced by guys, struts or other approved means which shall be supplied and installed by the CONTRACTOR as required till the installation work is satisfactorily completed. Such guys, shoring, bracing, strutting, planking supports etc. shall not interfere with the work of other agencies and shall not damage or cause distortion to other works executed by the CONTRACTOR or



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other agencies.

The CONTRACTOR shall duly comply with manufacturer(s) recommendations and detailed specifications for the installation of the various equipment and machines.

Various tolerances required as marked on the drawings and/or in accordance with the specifications and/or instructions of the Engineer-in-charge shall be maintained. Verticality shall be verified with the Theodolite and shall be maintained.

#### **60.0 MECHANISATION OF CONSTRUCTION ACTIVITIES AND MOBILISATION OF CONSTRUCTION EQUIPMENT**



##### **MECHANISATION OF CONSTRUCTION ACTIVITIES**

The CONTRACTOR shall mechanise the construction activities to the maximum extent by deploying all necessary construction equipment/machinery in adequate numbers and capacities. However, in operational area of OWNER's Plant, based on the instruction of Engineer-in-charge / OWNER, manual excavation may be needed to be carried out.

Wherever Structural/ Piping works are included in the scope, the responsibilities of CONTRACTOR shall include establishing and maintaining of a proper fabrication workshop with transportation facilities to site to carryout fabrication of steel structures, piping specials etc., preparing approaches working areas for the movement/operation of cranes and levelling the areas for assembly/erection to ensure effective mechanisation on the works. The CONTRACTOR shall acquaint himself with availability of access, facilities such as railway siding, local labour etc. and the CONTRACTOR may have to build temporary access roads to aid his work and the quoted and agreed rates shall be deemed to include the same.

For speedy execution of work, CONTRACTOR shall also ensure use of computer software for at least the following:

- i) Billing
- ii) Planning & Scheduling
- iii) Progress Reporting
- iv) Material Control & Warehousing
- v) Safety Records
- vi) Resource Deployment

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CONTRACTOR further agrees that Contract price is inclusive of all the associated costs, which he may incur for actual mobilization, required in respect of use of Mechanized construction techniques and that OWNER in this regard shall entertain no claim whatsoever.

#### **61.0 MOBILISATION OF CONSTRUCTION EQUIPMENTS**

The CONTRACTOR shall without prejudice to his responsibilities to execute and complete the work as per the specifications and time schedule, progressively deploy required construction equipment, tools and tackles and further augment the same depending on the exigencies of work and as decided by the Engineer-in-Charge so as to suit the construction schedule within scheduled completion date without any additional cost to OWNER.

#### **62.0 SINGLE POINT RESPONSIBILITY**

The entire work as per Scope of Work covered under this contract shall be awarded on single point responsibility basis.

#### **63.0 LEADS**

For the various works, in case of contradiction, leads mentioned in the Schedule of Rates shall prevail over those indicated in the Technical specifications.



#### **64.0 TESTS AND INSPECTION OF WORKS**

The CONTRACTOR shall carry out the various tests as enumerated in the bidding document and as per direction of Engineer-in-charge either on field or outside/ laboratories concerning the execution of work and supply of the material by CONTRACTOR. All the expenses shall be borne by the CONTRACTOR and shall be considered as included in the quoted price. The inspection shall be done by followings:

- (i) Representative deputed by Engineer-in-charge.
- (ii) Representative deputed by Statutory Authority.

CONTRACTOR shall give prior notice sufficiently ahead of time to the Engineer-in-charge and also to the authorities to conduct inspection/ to witness such tests.

All the tests either on the field or at outside laboratory concerning the execution of the work and supply of materials by the CONTRACTOR shall be carried out by the CONTRACTOR at his own cost.

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The work is subject to inspection at all times by the Engineer-in-charge. The CONTRACTOR shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this bidding document, the technical documents that will be furnished to him during performance of work and the relevant codes of practice furnished to him during the performance of the work.

The CONTRACTOR shall provide for purposes of inspection, access ladders, lighting and necessary instruments at his own cost including Low Voltage (24V) lighting equipment for inspection of work. Compressed air for carrying out works shall be arranged by the CONTRACTOR at his own cost.

Any work not conforming to the execution drawings, specifications or codes shall be rejected forthwith and the CONTRACTOR shall carry out the rectifications at his own cost.

All results of inspection and test will be recorded in the inspection reports, proforma of which will be approved by the Engineer-in-charge. These reports shall form part of the Completion Documents.



Inspection and acceptance of the work shall not relieve the CONTRACTOR from any of his responsibilities under this contract.

Cost towards repeat tests and inspection due to failures, repairs etc. for reasons attributable to the CONTRACTOR shall be borne by the CONTRACTOR.

CONTRACTOR shall arrange for third party inspection by any of the agencies specified in the Bidding Document. The prices shall be inclusive of charges towards third party inspection. Coordination and liaisoning etc. with third party inspection agency shall also be the responsibility of the CONTRACTOR.

## 65.0 FINAL INSPECTION

After completion of all tests as per specification the whole work will be subject to a final inspection to ensure that job has been completed as per requirement. If any defects noticed in the work are attributable to CONTRACTOR these shall be attended by the CONTRACTOR at his own cost, as and when they are brought to his notice by OWNER. OWNER shall have the right to have these defects rectified at the risk and cost of the CONTRACTOR if he fails to attend to these defects immediately.

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#### 66.0 COMPLETION DOCUMENTS

The CONTRACTOR shall carryout various tests as called for in bidding document either on field or at outside approved laboratories at his own cost. All test results and related documents shall be submitted as part of completion documents as instructed by engineer in charge.

The following documents in addition to documents specified, shall be submitted in hard binder by the CONTRACTOR, as a part of Completion documents:

- a) Test Certificate from manufacturers for all supply material.
- b) All document related to civil, electrical, plumbing, interior, RCC, PCC work etc. as per Quality assurance plan approved by engineer in charge.
- c) All as built drawings, organization chart with experience certificate, job procedure etc
- d) Any other drawing/ document/ report specified elsewhere in the bidding Document/ any test carried out as per instruction of EIC etc.
- e) Guaranty certificate for all fittings, supplied as instructed by EIC.



#### 67.0 ADDITIONAL WORKS/ EXTRA WORKS

OWNER reserves their right to execute any additional works/ extra works, during the execution of work, either by themselves or by appointing any other agency, even though such works are incidental to and necessary for the completion of works awarded to the CONTRACTOR. In the event of such decisions taken by OWNER, CONTRACTOR is required to extend necessary cooperation, and act as per the instructions of Engineer-in-Charge. This is without prejudice to the rights of OWNER to get the additional works/ extra works executed by the CONTRACTOR.

#### 68.0 COMPUTERISED CONTRACTOR'S BILLING SYSTEM

Without prejudice to stipulation in General Conditions of Contract, CONTRACTOR should follow following billing system:

The bills will be prepared by the CONTRACTOR on their PCs as per the standard formats and codification scheme proposed by OWNER The CONTRACTOR will be provided with data entry software to capture the relevant billing data for subsequent processing. The CONTRACTOR will submit these data to OWNER in an electronic media along with

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the hard copy of the bill,

necessary enclosures and documents. The CONTRACTOR will also ensure the correctness and consistency of data so entered with the hard copy of the bill submitted for payment. OWNER will utilize these data for processing and verification of bill of the CONTRACTOR.



## 69.0 CHANGE OF QUANTITIES

### D) **New Clause:**

- A. The WORK covered under this CONTRACT having to be executed by the Contractor on a item rate quoted by him, Owner will not accept any proposals for changes in CONTRACT VALUE or extension in time on account of any such changes which may arise to the Contractor's scope of WORK as a result of detailed Engineering and thereafter during the execution of WORK. The only exception to this will be a case where Owner requests in writing to the Contractor to upgrade the SPECIFICATIONS or the size of any major pieces of equipments, plant or machinery beyond what is normally required to meet the scope of WORK as defined in the CONTRACT DOCUMENT.

In such cases, a change order will be initialled by the Contractor at the appropriate time for Owner's prior approval giving the full back-up data for their review and for final settlement of any impact on price within 30 (thirty) days thereafter.



- B. The ENGINEER-IN-CHARGE shall have to make any alterations in, omission from, additions to or substitutions for, the Schedule of Rates, the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the WORK and the Contractor shall be bound to carry out the such altered/ extra/ new items of WORK in accordance with any instructions which may be given to him in writing signed by the ENGINEER-IN-CHARGE, and such alterations, omissions, additions or substitutions shall not invalidate the CONTRACT and any altered, additional or substituted work which the Contractor may be directed to do in the manner above specified as part of the WORK shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the main WORK. The time of completion of WORK may be extended for the part of the particular job at the discretion of the ENGINEER-IN-CHARGE, for only such alterations, additions or substitutions of the WORK, as he may consider as just and reasonable. The rates for such additional, altered

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or substituted WORK under this clause shall be worked out in accordance with the following provisions:-

- i. If the rates for the additional, altered or substituted WORK are specified in the CONTRACT for the WORK, the Contractor is bound to carry on the additional, altered or substituted WORK at the same rates as specified in the CONTRACT.
- ii. If the rates for the additional, altered or substituted WORK are not specifically provided in the CONTRACT for the WORK, the rates will be derived from the rates for similar class of WORK as are specified in the CONTRACT for the WORK. The opinion of the ENGINEER- IN- CHARGE, as to whether or not the rates can be reasonably so derived from the items in this CONTRACT will be final and binding on the Contractor.
- iii. If the extra works are of similar character and of equivalent value and/ or executed under similar conditions as to any item of work appearing at schedule of quantities of CPWD (Delhi Schedule of Rates), then the rates for such extra items shall be equal to the rates of such items or lower rate of the identical item. Wherever CPWD rates are not available, PWD Bangalore rates shall be used.
- iv. If the rates for the altered, additional or substituted WORK cannot be determined in the manner specified in sub-clause (i), (ii) and (iii) above, then the Contractor shall, within 7 days of the date of receipt of instruction to carry out the WORK, inform the ENGINEER-IN- CHARGE of the rates which it is his intention to charge for such class of WORK, supported by analysis of the rate or rates claimed, and the ENGINEER-IN-CHARGE shall determine the rate or rates on the basis of the prevailing market rates, labour cost at schedule of labour rates plus 15% to cover contractor's supervision, overheads and profit and pay the CONTRACTOR accordingly. The opinion of the ENGINEER- IN-CHARGE as to current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the CONTRACTOR.
- v. Where the item of work will be executed through nominated specialist agency as approved by the ENGINEER-IN-CHARGE, then the actual amount paid to such nominated agency supported by documentary evidence and as certified by ENGINEER-IN-CHARGE shall be considered plus 15% (Fifteen percent) to cover all contingencies, overhead, profits to arrive at the rates.



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II) Clause No. 2.6.2.0 of General Contract Conditions (GCC) stands deleted .

## 70.0 SUSPENSION

Clause No. 2.8.0.0 of GCC stands modified to the extent as follows:

If the suspension is ordered for reasons not attributable to the Contractor, then:

- a. Beyond 05 days of continuous suspension, Contractor shall be entitled for an extension of the time equal to the period of suspension plus 25%.

## 71.0 PRICE ADJUSTMENT FOR SLIPPAGE IN COMPLETION

The Clause No. 4.4.0.0 of GCC stand partially modified to the following extent :

In case of any delay in Completion of all works beyond the Time schedule as defined in Annexure 1 to SCC, the Owner shall be entitled to a discount in the total Executed contract price. The discount shall be applicable at the rate of 0.5% (half percent) of the total Contract Value for every week of the delay or part thereof subject to a maximum of 5% of the total Contract Value. The above discount shall be recovered by the Owner out of the amounts payable to the Contractor or from any Bank Guarantees or Deposits furnished by the Contractor or the Retention Money retained from the Bills of the Contractor, either under this contract or any other Contract with Owner.




## 72.0 DEFECT LIABILITY PERIOD:

The Defect Liability Period Clause No 5.6.0.0 of GCC stands modified as below:

The Defect Liability Period (including the materials incorporated therein within the Contractor's scope of supply) shall be 12 (twelve) months from the date of Completion of Construction, as mentioned in Completion certificate.

The CONTRACTOR shall, at his own cost and initiative, correct, repair and/or rectify any and all defect(s) and/or imperfections in the design of the work (insofar as the CONTRACTOR shall be concerned with the design of the work or any part thereof) and/or in the work performed and/or materials, components or other items incorporated therein within the CONTRACTOR's scope of supply as shall be discovered during the Defect Liability Period and in the event of the CONTRACTOR failing to do so, the provisions of GCC Clauses 5.2.7.0 and 5.2.7.1 hereof shall apply.

Any defect rectified by CONTRACTOR during the Defect Liability Period must be further guaranteed for an additional twelve (12) months after the rectification work is accepted

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by the OWNER.

### **73.0 ABNORMALLY HIGH RATES ITEMS (AHR ITEMS)**

Being pre-priced tender, this clause is not applicable.

### **74.0 MAKE OF EQUIPMENTS/COMPONENTS :**

Bidders shall procure and supply the items covered in their scope from the approved vendors as mentioned in technical specification. Wherever an item is specified or described by a particular brand name, manufacturer or vendor, the specific item mentioned shall be for establishing type, function and quality desired. Other manufacturer's products will be considered, provided sufficient information are furnished to the Employer to assess the products proposed as equivalent and acceptable. Contractor shall take prior approval from Engineer-in-Charge for procuring such items which are not covered under approved vendor list.

### **75.0 CALIBRATION REQUIREMENTS OF MONITORING AND MEASURING DEVICES AT CONSTRUCTION SITES**

The Calibration requirements of monitoring and measuring devices at Construction sites are attached as Annexure-VII to SCC.

### **76.0 SUB-CONTRACTING**



If the CONTRACTOR is required to engage a Sub-Contractor for any part of work, then such Sub-Contractors shall have prior proven experience of similar work.

Following the notification of Acceptance of Bid, the CONTRACTOR will submit to the OWNER for approval the details of Sub-Contractors. CONTRACTOR shall ensure that very competent and resourceful agencies with proven track record and performance should be proposed for the work to be sub-contracted as per format attached in Annexure - VI to SCC.

- (i) Any Sub-Contractor being appointed by the successful bidder should not be in holiday list of any ministries of Govt. of India / PSU's and proper approval to be taken from EIC.
- (ii) If the CONTRACTOR is required to engage a Sub-Contractor for any part of work, then such Sub-Contractors shall have prior proven experience of similar.

### **77.0 PROJECT SPECIFIC ACCOUNT**

For the benefit of the Project, it is desired that the CONTRACTOR shall maintain Project

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Specific Bank Accounts, with a bank approved by the OWNER to ensure that finances released by the OWNER, line of credit received from the lenders to meet working capital requirements and all revenues & other receipts arising from the CONTRACT and under any agreements are deposited into such Account(s). Withdrawals and appropriations during the Contract Period, at any relevant time, from such Account(s) shall be made only for the purpose of Project/Project Facilities and Services.

#### **78.0 PENALTY CLAUSES:**



Subject to non-compliance to any terms and conditions of the contract, the Engineer-in-Charge may instruct the Contractor through written communication (by way of mail/ letter or SMS) to suspend all/any ongoing activity(ies) at work site. The Contractor shall immediately stop the ongoing work till further clearance from the Engineer-in-Charge to restart the work is obtained. Time lost in the process shall be attributable to the Contractor and shall not be entertained for request for time extension.

Penalty, subject to violation of terms attributable to the Contractor, shall be levied in RA bills of the Contractor on failure to comply with terms and conditions of the contract.

#### **79.0 SPECIFICATIONS FOR DOCUMENTATION REQUIREMENTS FROM CONTRACTORS- As per Technical Specification Part-II**

#### **80.0 DEFINITIONS**

- a) For the purpose of the Contract, unless otherwise specified or repugnant to the subject or context, the following terms shall be deemed to have the following meanings. These are in addition to the defined words appearing in General Conditions of Contract (GCC) and wherever there are contradictions, the definitions appearing in the SCC shall take precedence.
- b) "CONTRACTOR" means any person, company, firm or body who may be engaged by OWNER for works and services connected with construction, installation, erection and commissioning of the facilities for the Project with or without supply of equipment/material.
- c) "Project" means Construction of PP Petcoke road, Truck Parking yard and Driver's Rest

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- d) "SITB" means Special Instructions to Bidders
- e) "EMD" means Earnest Money Deposit.
- f) "GCC" means General Conditions of Contract.
- g) "SCC" means Special Conditions of Contract.
- h) "SOP/ SOR" means Schedule of Prices/ Schedule of Rates.
- i) "BQC" means Bidder Qualification Criteria.
- j) "Bidder/ Tenderer" means any person, company, firm or body who are issued the Bidding Document by OWNER for submission of bid.
- k) "Bidding Document/ Tender Document" means document to be issued to Bidder based on which Bid is to be submitted.
- l) "Bid/ Offer" means the documents/proposal submitted by Bidder.
- m) "CD" means Compact Disc.
- n) OWNER /MRPL means "Mangalore Refinery & Petrochemicals Limited".
- o) EIC means "Engineer in-charge"

#### **81.0 MOBILIZATION ADVANCE**

Mobilization advance shall not be applicable for this tender

#### **82.0 WATER PROOFING GUARANTY**

Contractor has to submit 3 years guarantee from the date of completion certificate signed in legal stamp paper after completion of the work against water leakage for roof, wall etc

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**[ANNEXURE - I TO SPECIAL CONDITIONS OF CONTRACT)**

**TIME SCHEDULE**

NAME OF WORK	TIME FOR COMPLETION OF WORK
<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA as per the Tender documents</b>	Mechanical Completion within <b>Six (6)</b> months from the date of issue of Letter of Acceptance.  Closure of Contract <b>within 3 (Three) Months</b> from Completion.



A joint plan of execution of work shall be prepared by the Contractor and EIC.

**Note:**

- Time for completion shall be reckoned from date of issue of Fax/ Letter of Acceptance, whichever is issued earlier.
- The time indicated for completing all works in all respects including submission of all reports as per specifications, codes, drawings and instructions of Engineer-in-Charge.
- It should be noted that the period of work given above includes the time required for Mobilization at site, carrying out the works as per the requirements of Contract documents, demobilization, preparation of all reports in requisite quantities as mentioned in the Bidding Document, rectification's, if any, rework etc., complete in all respects to the entire satisfaction of Owner/ Engineer-in-Charge and direction of Engineer-in-charge.

The Contractor shall scrupulously adhere to the Targets/Plan by deploying adequate personnel, construction equipment, tools and tackles and also by timely supply of required materials coming within his scope of supply as per Contract

(STAMP & SIGNATURE OF BIDDER)

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**[ANNEXURE - II TO SPECIAL CONDITIONS OF CONTRACT]**



**MEASUREMENT OF WORK**

**1.0 GENERAL**

- 1.1. The mode of measurement shall be as mentioned in relevant standard specification incorporated in the Bidding Document. Any other mode of measurements not covered in above specifications shall be followed in accordance with relevant BIS codes /Schedule of Rates/ Specifications etc. and/or as decided by Engineer-in-Charge. Only the relevant mode(s) of measurement as detailed in this Section shall be applicable for the items covered in the scope of work / Schedule of Rates of the Bidding Document.
- 1.2. Payment will be made on the basis of joint measurements taken by Contractor and certified by Engineer-In-Charge. Measurement shall be based on "Approved for Construction" drawings, to the extent that the work conforms to the drawings and details are adequate.
- 1.3. Wherever work is executed based on instructions of Engineer-In-Charge or details are not adequate in the drawings, physical measurements shall be taken by Contractor in the presence of Engineer- In-Charge.
- 1.4. Measurements of weights shall be in metric tonnes corrected to the nearest Kilogram. Linear measurements shall be in meters corrected to the nearest centimeters.
- 1.5. The weights mentioned in the drawing or shipping list shall be the basis for payment. If mountings for panels etc. are packed separately, their erection weights shall include all mountings.
- 1.6. No other payment either for temporary works connected with this Contract or for any other item such as weld, shims, packing plates etc. shall be made. Such items shall be deemed to have been included for in the rates quoted.
- 1.7. Measurements will be made for various items under schedule of rates on the following basis as indicated in the unit column

i) Weights	MT or Kg
ii) Length	M (Metre)
iii) Number	No.







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iv) Volume                      Cu.M

v) Area                              Sq.M

- 1.8. Wherever the unit of items has been indicated as lumpsum, the payment shall be made on lumpsum basis on completion & no mode of measurement shall be applicable.
- 1.9. The measurement for cable laying shall be made on the basis of length actually laid from lug to lug including length of loops provided

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**[ANNEXURE - III TO SPECIAL CONDITIONS OF CONTRACT]**

**PAYMENT TERMS FOR CONTRACTS ON ITEM RATE BASIS**



**TERMS OF PAYMENT**

**1.0 MOBILISATION ADVANCE**

OWNER do not entertain Advance payment. In case, Mobilisation advance is insisted by successful bidder, the same shall be decided on need basis only. The advance payment is recoverable proportionately from the progressive bills duly certified by the Engineer- in-charge.

Full advance will be recovered against payments due on Mechanical Completion of the work / completion of supply as applicable. Such recovery shall be time based, but not essentially linked with progress of work. Interest free advance payment is not allowed for any cases.

- 1.1 Contractor, if requested, shall be paid fully recoverable interest-bearing Mobilization Advance up to a maximum of 10% (Ten Percent) of awarded Contract Value. The mobilization advance will attract an interest @ SBI lending rate prevailing at the time of release of payment plus 2%.
- 1.2 Interest bearing Mobilization advance payment shall be released in 2 or more instalments / Stages as mutually agreed, based on progress of the work / Mobilization, in the following manner:
- 1.2.1 **First Instalment:** 5% (Five percent) of awarded Contract value shall be payable as the first instalment of mobilization advance after fulfilling the following formalities by the Contractor:
- i. Signing of contract agreement by the Contractor.
  - ii. Submission of a separate bank guarantee towards Contract Performance from an Indian Nationalised / Scheduled Bank / Indian branch of International Bank in approved proforma towards due performance of contract.
  - iii. Submission of a separate Bank Guarantee from an Indian Nationalised / Scheduled Bank / Indian branch of International Bank as stipulated in approved proforma equivalent to 10% of 110% of the awarded contract value covering mobilization advance which shall be kept valid till completion of work. However, contractor may submit Bank Guarantee of 10% as above in two stages of 5% each for availing advance against clauses 1.2.1 & 1.2.2.

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1.2.2 **Second Instalment:** The next / subsequent instalment of such advance shall be released only after submission of utilisation certificate for the previous advance instalment paid and satisfy the OWNER/Engineer-in-charge in this regard.

However, release of 2nd Instalment will be at the discretion of the OWNER.

1.3 Part Bank Guarantees based on advance instalments are also allowed.

1.4 The advance payment is recoverable proportionately from the progressive bills duly certified by the Engineer-in-charge. Full advance will be recovered against payments due on Mechanical Completion of the work/completion of supply as applicable. Such recovery shall be time based, but not essentially linked with progress of work.

1.5 Interest free advance payment is not allowed for any cases.

## 2.0 SECURED ADVANCE ON MATERIALS

Secured Advance shall be paid as per the agreement with Owner on case to case basis. Release of secured advance will be at the discretion of the OWNER. However, no secured advance shall be paid against the material wherever milestone payment has been recommended on receipt and acceptance of material at site.



## 3.0 ON ACCOUNT PAYMENTS

Progressive payments shall be released to Contractor against running account bills as per the approved billing schedule duly certified by PMC after affecting the necessary deductions/recovery, if any within 15 days of receipt of duly certified invoice forwarded by PMC.



### 3.1 PAYMENT TERMS FOR PIPING & MECHANICAL

Subject to the other provisions of Contract documents, on account payments for the supplies will be made as follows:

- a) 10% (ten percent) of supply value on pro-rata basis on submission of engineering deliverables of supply items and their approval against the CONTRACTOR's certified Running Account Bill(s).
- b) 10% (ten percent) of supply value on placement of Purchase Order/ sub orders for supply items on pro-rata basis against CONTRACTOR's certified running Accounts Bill(s) and against submission of equivalent value of BG. This BG shall be in addition to PBG. The BG shall be released after receipt of material and acceptance at site.
- c) 60% (sixty percent) of the supply value on receipt of material at site and inspection and acceptance of the same on pro-rata basis against CONTRACTOR's certified running Accounts Bill(s).
- d) 10% (ten percent) of supply value shall be released on installation, testing and completion of all works on pro-rata basis against CONTRACTOR's certified running Accounts Bill(s).
- e) 5% (five percent) of supply value on issue of Mechanical Completion Certificate against CONTRACTOR's certified running Accounts Bill(s).

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- f) 5% (five percent) of supply value on commissioning, completion of all jobs and submission and acceptance of Final “As built” Drawings along with Electronic native files for all documents as per PMC/OWNER Documentation Procedure, against the CONTRACTOR’s certified Final Bill.
- 3.1.1 If the Contractor has completed all the supplies and is not able to complete the installation, testing and completion of works of such supplies beyond 2(two) months from original contractual completion period / extended contractual period for reasons not attributable to the Contractor, then account payments for such supplies towards para 3.1(d) and 3.1(e) above shall be released on pro-rata basis against Contractor’s certified running Account bill(s) upon submission of an equivalent amount of Bank Guarantee (BG) valid for a period of 12 months and extended further, as the case may be till the completion of works of such supplies. After the completion and acceptance of works for such supplies as certified by PMC, the above BG shall be released to the Contractor. This BG shall be in addition to the PBG already submitted by the Contractor.
- 3.1.2 If the Contractor has completed all the supplies and is not able to complete and commission the works of such supplies beyond 3(three) months from original contractual completion period / extended contractual period for reasons not attributable to the Contractor, then account payments for such supplies towards para 3.1(f) above shall be released on pro-rata basis against Contractor’s certified running Account bill(s) upon submission of final “AS BUILT” drawings along with electronic native format and submission of an equivalent amount of Bank Guarantee (BG) valid for a period of 12 months and extended further, as the case may be till the completion and commissioning of works of such supplies. After the completion, commissioning and acceptance of works for such supplies as certified by PMC, the above BG shall be released to the Contractor. This BG shall be in addition to the PBG already submitted by the Contractor.
- 3.1.3 The payable for supplies as mentioned above shall include the cost of all transportation, freight, demurrage and penalties, clearing, forwarding, loading, unloading, packing and handling of shipments and all other overheads whatsoever involved in customs clearance and lifting imported goods from the port of entry within India upto delivery at the warehouse at site, warehouse management, preservation, and transportation, site handling, loading and unloading from godown to CONTRACTOR’s fabrication yard or to job site and from CONTRACTOR’s fabrication yard to job site, and collection, loading, transportation and unloading of surplus material to OWNER’s warehouse/stockyard.
- 3.2 FOR ONLY INSTALLATION, TESTING AND COMMISSIONING LINE ITEMS IN PRE-FILLED FORM SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4**
- a) 80% (eighty percent) on erection/installation etc. on pro-rata basis against the CONTRACTOR’s certified Running Account Bill(s).
- b) 10% (ten percent) on testing of system on pro-rata basis against the CONTRACTOR’s certified Running Account Bill(s).
- c) 5% (five percent) on issue of Mechanical Completion Certificate against the CONTRACTOR’s certified Running Account Bill(s).

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d) 5% (five percent) on commissioning, completion of all jobs and submission and acceptance of Final “As built” Drawings along with Electronic native files for all documents as per PMC/OWNER Documentation Procedure, against the CONTRACTOR’s certified Final Bill.

### **3.3 FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING LINE ITEMS IN PRE-FILLED FORM SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4**

3.3.1 For such line items, the SOR shall be split in the ratio of 60:40 i.e 60% towards SUPPLY and 40% towards INSTALLATION, TESTING AND COMMISSIONING for billing and payment purposes on prorata basis.

3.3.2 For SUPPLY portion, the payment terms shall be as per Para 3.1 clauses

3.3.3 For INSTALLATION, TESTING AND COMMISSIONING portion, the payment terms shall be as per Para 3.2 clause.

### **4.0 PENALTIES**

Payments are subject to deductions towards the Penalties as per various penalties mentioned elsewhere in the tender.



### **5.0 SUBMISSION OF INVOICES**

The Contractor on completion of activity as explained above shall submit invoice in triplicate to CONSULTANT along with proof of completion for claim of payment against completion of activity or part thereof. CONSULTANT after scrutinizing the same shall recommend to OWNER for release of payment against the same. The contractor shall also submit payment status schedule updated along with the invoices.



#### **NOTE:**

1. The above payment terms commensurate with the work executed.
2. The above progress payments are subject to deductions towards income tax and other deductions as applicable as per terms of the Contract.
3. Withholding Tax at the prevailing rate shall be deducted as per the Indian Income Tax Act. TDS certificate shall be issued by the PMC/OWNER.
4. Unless otherwise specified, 100% Payment will be made for the actual work done / supply of materials/Job/services performed and bills duly certified by Engineer In-charge / PMC (subject to submission of SD/PBG, if applicable). Such payment will be made within 15 days of receipt of duly certified invoice forwarded by PMC.
5. Retention money, if specified, will be withheld before releasing all payments i.e either monthly or progressive/ stage-wise payments.
6. Bills can be submitted after completion of work against progressive work completion/as per milestones specified.
7. All payments shall be through electronic mode (RTGS/NEFT). Therefore, vendors are requested to furnish the information as per attached format on issue of order to successful bidder. Any change in the particulars shall be immediately informed to OWNER.





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8. Completion certificate is the certificate issued after attending the defects prior to taking over as specified in the General Conditions of Contract. In case separate nomenclature is provided for Completion certificate in GCC for various clients, the same shall be replaced by that certificate accordingly.
9. Wherever milestone payment has been recommended on receipt and acceptance of material, the same shall be released against “Incoming Material Inspection Report”. PMC shall recommend to release the progressive payment towards supply in such a way ensuring that the total quantity against which the payment is released towards supply shall not exceed the final installed quantity of the item.
10. The above mile stone or progress payments are subject to submission of PBG/Security deposit to OWNER and Signing of contract agreement.
11. For all supplies, payment towards GST shall be paid to the Contractor against submission of tax invoice and proof of payment of GST to Government i.e., on auto-population under GST portal. In case of non-submission of tax invoice or non-payment of GST by the Contractor / unable to verify the payment under GST portal, MRPL shall withhold the payment of GST to the Contractor.
12. 100% payment of GST and other taxes and duties shall be released to the Contractor along with the milestone payment released against submission of Tax Invoices (wherever applicable) by Contractor as per GST Invoicing rules and regulations.

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**QUALIFICATION & EXPERIENCE  
REQUIREMENT OF  
KEY CONSTRUCTION PERSONNEL  
AND PENALTY FOR THEIR NON-  
MOBILISATION**



**[ANNEXURE - IV TO SPECIAL CONDITIONS OF CONTRACT]**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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**QUALIFICATION & EXPERIENCE REQUIREMENT OF KEY CONSTRUCTION PERSONNEL AND  
PENALTY FOR THEIR NON-MOBILIZATION**

1. QUALIFICATION & EXPERIENCE (POST QUALIFICATION) AND DEPLOYMENT -

CATEGORY	QUALIFICATION & EXPERIENCE (POST QUALIFICATION) REQUIRED		
Resident Construction Manager/ /Site-In-Charge	Degree or Diploma in Engineering with following minimum relevant experience in construction:		
	Contract value (Rs) →	≤20 Cr. works	> 20 Cr. works
	Degree holders	6 years	10 years
	Diploma holders	8 years	12 years
Lead Mechanical Discipline Engineer	Degree or Diploma in relevant Engineering discipline with following minimum experience in Construction:		
	Contract value (Rs)→	≤20 Cr. works	> 20 Cr. works
	Degree holders	2 years	6 years
	Diploma holders	4 years	8 years
Lead QA/QC Engineer	Degree or Diploma in Engineering with following minimum experience:		
	Contract value (Rs)→	≤20 Cr. works	> 20 Cr. works
	Experience	4 years of construction Experience of which 2 years in QA/QC.	6 years of construction Experience of which 3 years in QA/QC.
Lead Planning Engineer	Degree/Diploma in Engineering with following minimum experience in Planning & Scheduling:		
	Contract value (Rs)→	≤20 Cr. works	> 20 Cr. works
	Experience	3 year	6 yr
Safety Officer/ Supervisor	As per specification for HSE Management at construction sites enclosed elsewhere in the bid.		

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<b>Discipline Engineer (Including Mechanical / NDT, QA/QC and Planning)</b>	Degree in relevant Engineering Discipline with minimum 1 years of relevant experience in construction or Diploma in relevant Engineering Discipline with minimum 2 years of relevant experience in Construction. Mechanical Engineer shall possess supervisory license issued by Govt. Welding /NDT engineer shall possess valid Level-II certificate in the relevant NDT methodology (RT/UT)	



**Notes:**

- a. CVs of key construction personnel proposed to be deployed shall be submitted to PMC/OWNER prior to their mobilization at site.
- b. The mobilization of key personnel shall be done at site subject to prior approval of their CVs by PMC/OWNER.
- c. Mobilisation of personnel shall be done as per approved mobilisation plan and as directed by PMC/OWNER.



**2. KEY CONSTRUCTION MANPOWER TO BE DEPLOYED BY CONTRACTOR DURING EXECUTION OF PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE**

SL.NO	DESCRIPTION	Nos.
1.	RCM/ SITE-IN-CHARGE / LEAD DISCIPLINE PIPING & MECHANICAL ENGINEER	1
2.	LEAD QA/QC ENGINEER	1
3.	LEAD PLANNING ENGINEER	1
4.	SAFETY OFFICER, SAFETY SUPERVISOR, ETC.	AS PER HSE SPEC
5.	DISCIPLINE ENGINEERS+ SUPERVISORS PIPING & MECHANICAL ENGINEER	3

- a. Above key construction manpower is required to be deployed as a minimum by the contractor to complete the work within schedule. Contractor is required to augment the above list with additional numbers/categories of personnel as required and directed by Engineer-In charge to complete the work within the completion time schedule and quoted price.
- b. The Key Construction Personnel identified above shall be well qualified & having

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- c. adequate relevant experience, as specified in document enclosed elsewhere in the bidding document. The other manpower shall also be qualified and experienced with their assigned work.
- d. CVs of key persons proposed to be deployed shall be submitted to Owner/Engineer-In-charge prior to their mobilization at site. The mobilization of key personnel shall be done at site subject to prior approval of their CVs by Engineer-In-charge.

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#### 1. PENALTY FOR NON - MOBILIZATION OF KEY CONSTRUCTION PERSONNEL



Penalty for non-mobilization per day per person during the contractual mobilisation period /mobilisation schedule agreed during Kick off Meeting / jointly agreed between contractor and / owner based on front availability etc.

- Rs. 5000/- for Resident Construction Manager/ Resident Engineer/ Site-in-Charge;
- Rs. 3000/- for Lead Discipline Engineer & Safety Officer (As per HSE Specification)

#### **Notes: (for Penalty clauses)**



- a. All intervening off days (Sundays etc.) and holidays will be counted for levy of penalty
- b. Mobilised personnel shall not be demobilised till contractual completion or based on consent of Engineer-in-Charge else penalties as above shall be applied.
- c. Total of above penalties shall not exceed 3% of the contract value.
- d. The above penalties are over & above all other contractual provisions with respect to penalties.



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**SPECIFICATION FOR QUALITY MANAGEMENT SYSTEM**

**[ANNEXURE - V TO SPECIAL CONDITIONS OF CONTRACT]**

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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## 1.0 SCOPE

This specification establishes the Quality Management System requirements to be met by BIDDER for following purpose:

- QMS requirements to be met by suppliers/contractors after award of work/ during contract execution.

## 2.0 DEFINITIONS

### 2.1 Bidder

For the purpose of this specification, the word "BIDDER" means the person(s), firm, company or organization who is under the process of being contracted by / Owner for delivery of some products (including service). The word is considered synonymous to supplier, contractor or vendor.

### 2.2 Project Quality Plan

Document tailored from Standard Quality Management System Manual of BIDDER, Specifying how the quality requirements of the project will be met.

### 2.3 Owner

Owner means the owner of the project for which services / products are being purchased and includes their representatives, successors and assignees.

## 3.0 REFERENCE DOCUMENTS



Specification for Documentation Requirements from Contractors

Specification for Documentation Requirements from Suppliers

Conditions for Issue and Reconciliation of Materials 20005-GEN-SPC-SP-1000

## 4.0 QUALITY MANAGEMENT SYSTEM – GENERAL

Unless otherwise agreed with / Owner, the BIDDER proposed quality system shall fully satisfy all relevant requirements of ISO 9001 "Quality Management Systems – Requirements." Evidence of compliance shall be current certificate of quality system registration to ISO 9001 or a recent compliance audit recommending registration from a certification agency. The quality system shall provide the planned and systematic control

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of all quality related activities for execution of contract. Implementation of the system shall be in accordance with BIDDER'S Quality Manual and PROJECT specific Quality Plan.

## 5.0 QUALITY SYSTEM REQUIREMENTS



- 5.1 BIDDER shall prepare and submit for review / record, Project Quality Plan / Quality Assurance Plan for contracted scope / job. The BIDDER'S Quality Plan shall address all of the applicable elements of ISO 9001, identify responsible parties within BIDDER'S organization, for the implementation / control of each area, reference the applicable procedures used to control / assure each area, and verify the documents produced for each area. The Project Quality Plan shall necessarily define control or make reference to the relevant procedures, for design and engineering, purchase, documentation, record control, bid evaluation, inspection, production/manufacturing, preservation, packaging and storage, quality control at construction site, pre-commissioning, commissioning and handing over (as applicable) in line with contract requirement and scope of work.
- 5.2 BIDDER shall identify all specified or implied statutory and regulatory requirements and communicate the same to all concerned in his organization and his sub contractor's organization for compliance.
- 5.3 BIDDER shall deploy competent and trained personnel for various activities for fulfillment of PO / contract. BIDDER shall arrange adequate infrastructure and work environment to ensure that the specification and quality of the deliverable are maintained.
- 5.4 BIDDER shall do the quality planning for all activities involved in delivery of order. The quality planning shall cover as minimum the following:

- Resources
- Product / deliverable characteristics to be controlled.
- Process characteristics to ensure the identified product characteristics are realized
- Identification of any measurement requirements, acceptance criteria
- Records to be generated
- Need for any documented procedure

The quality planning shall result into the quality assurance plan, inspection and test plans (ITPs) and job procedures for the project activities in the scope of bidder. These documents shall be submitted to Owner for review/approval, before commencement of work.

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- 5.5 Requirements for sub-contracting / purchasing of services specified in contract / tender shall be adhered to. In general all outsourced items will be from approved vendors of . Wherever requirements are not specified, or approved sub vendors do not exist, the sub-contractor shall establish and maintain a system for purchasing / sub-contracting to ensure that purchased product / service conforms to specified requirements. Criteria for selection of sub-contractor, evaluation, re- evaluation, maintenance of purchasing data and verification of purchased product (subcontractor services), constitute important components of this requirement.
- 5.6 BIDDER shall plan and carry production and service provision under controlled conditions. Controlled conditions shall include, as applicable
- a) the availability of information that describes the characteristics of the product
  - b) the availability of work instructions
  - c) the use of suitable equipment
  - d) the availability and use of monitoring and measuring devices
  - e) the implementation of monitoring and measurement
  - f) the implementation of release, delivery and post-delivery activities
- 5.7 BIDDER shall validate any processes for production and service provision where resulting output cannot be verified by subsequent monitoring and measurement. This includes any process where deficiencies become apparent only after the product is in use or service has been delivered.
- 5.8 BIDDER shall establish a system for identification and traceability of product / deliverable throughout product realization. Product status with respect to inspection
- 5.9 BIDDER shall identify, verify, protect and safeguard / Owner property (material document) provided for use or incorporation into the product. If any Owner / property is lost, damaged or otherwise found to be unsuitable for use, this shall be reported to the / Owner.
- 5.10 BIDDER shall ensure the conformity of product / deliverable during internal processing and delivery to the intended destination. Requirements mentioned in the tender shall be adhered to.
- 5.11 BIDDER shall establish system to ensure that inspection and testing activities are carried out in line with requirements. Where necessary, measuring equipment's shall be calibrated at specified frequency, against national or international measurement standards; where no such standard exists, the basis used for calibration shall be recorded.

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The measuring equipment's shall be protected from damage during handling, maintenance and storage.

- 5.12 BIDDER shall ensure effective monitoring, using suitable methods, of the processes involved in production and other related processes for delivery of the scope of contract.
- 5.13 BIDDER shall monitor and measure the characteristics of the product/deliverable to verify that product requirement has been met. The inspection (stage as well as final) by BIDDER and / Owner personnel shall be carried out strictly as per the ITPs forming part of the contract. Product release or service delivery shall not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by relevant authority and where applicable by Owner.
- 5.14 BIDDER shall establish and maintain a documented procedure to ensure that the product which does not conform to requirements is identified and controlled to prevent its unintended use or delivery.
- 5.15 All non-conformities (NCs) / deficiencies found by the BIDDER'S inspection / surveillance staff shall be duly recorded, including their disposal action shall be recorded and resolved suitably. Effective corrective and preventive action shall be implemented by the BIDDER so that similar NCs including deficiencies do not recur.
- 5.16 All deficiencies noticed and reported by / Owner shall be analyzed by the BIDDER and appropriate corrective and preventive actions shall be implemented. BIDDER shall intimate / Owner of all such corrective and preventive action implemented by him.
- 5.17 BIDDER should follow the standards, specifications and approved drawings. Concessions/Deviations shall be allowed only in case of unavoidable circumstances. In such situations Concession/deviation request must be made by the BIDDER through online system of eDMS. URL of edms is <http://edocx.Co.in/portal>.
- 5.18 BIDDER shall have documented procedure for control of documents.
- 5.19 All project records shall be carefully kept, maintained and protected for any damage or loss until the project completion, then handed over to / Owner as per contract requirement or disposed as per relevant project procedure.

## 6.0 AUDITS

BIDDER shall plan and carry out the QMS audit for the job. Quality audit program shall cover design, procurement, construction management and commissioning as applicable including activities carried out by sub-vendors and sub-contractors. This shall be additional



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to the certification body surveillance audits carried out under BIDDER'S own ISO 9001 certification scheme.

The audit programmes and audit reports shall be available with bidder for scrutiny by / Owner. or Owner's representative reserves the right to attend, as a witness, any audit conducted during the execution of the WORKS.

In addition to above, Owner and third party appointed by /Owner may also perform Quality and Technical compliance audits. BIDDER shall provide assistance and access to their systems and sub-contractor / vendor systems as required for this purpose. Any deficiencies noted shall be immediately rectified by BIDDER.

## 7.0 DOCUMENTATION REQUIREMENTS



BIDDER shall submit following QMS documents immediately after award of work (Within one week) for record / review by / Owner.

- Organization chart (for complete organization structure and for the project)
- Project Quality Plan/Quality Assurance Plan
- Job specific Inspection Test Plans, if not attached with PR
- Job Procedures
- Inspection/Test Formats

In addition to above QMS documents, following documentation shall be maintained by the BIDDER for submission to / Owner on demand at any point of time during execution of the project.

- Quality Manual
- Certificate of approval for compliance to ISO: 9001 standard
- Procedure for Control of Non-conforming Product
- Procedure for Control of Documents
- Sample audit report of the QMS internal and external audits conducted during last one year
- Customer satisfaction reports from at least 2 customers, during the last one year
- Project QMS audit report
- Technical audit reports for the project
- Corrective action report on the audits



Documents as specified above are minimum requirements. BIDDER shall submit any other document/data required for completion of the job as per /Owner instructions.

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**APPROVAL OF CONSTRUCTION**

**SUB-CONTRACTOR**

**[ANNEXURE - VI TO SPECIAL CONDITIONS OF CONTRACT]**

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**(APPROVAL OF CONSTRUCTION SUB-CONTRACTOR)**

1) NAME OF MAIN CONTRACTOR: \_\_\_\_\_

2) NAME OF WORK, LOCATION: \_\_\_\_\_

3) NAME OF PROPOSED

SUB-CONTRACTOR: \_\_\_\_\_

4) SCOPE OF WORK PROPOSED TO

BE SUB-CONTRACTED (BRIEF): \_\_\_\_\_

5) ESTIMATED VALUE OF THE PROPOSED

WORK TO BE SUB-CONTRACTED (INR): \_\_\_\_\_



6) QUALIFYING CRITERIA FOR SUB-CONTRACTOR:

i. Similar Work experience :

Completed one Contract of 80% or two contracts of 50% or three contracts of 40% of estimated value of proposed work to be sub-contracted, in preceding Seven years.

ii. Annual Turnover

Average annual Turnover during the last three years shall not less than 30% of estimated value of proposed work to be sub-contracted.

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7) EXPERIENCE AND FINANCIAL DETAILS OF PROPOSED SUB-CONTRACTOR:

- i) Contract Value of similar work Executed (As evidenced by work Order & Completion Certificate) :
- ii) Maximum Annual Turnover during Last 3(three) years (as evidenced by Balance Sheets) :

8) CRITERIA FOR QUALIFICATION OF SUB-CONTRACTOR:



- i) Sl.No. 7(i) >Sl. No.6 (i) YES / NO
- ii) Sl.No. 7(ii) >Sl. No.6 (ii) YES / NO

9) Based on above information, we M/s \_\_\_\_\_ (Name of Main Contractor) propose M/s. \_\_\_\_\_ (Name of proposed sub-contractor) as our sub-contractor for the above mentioned works. We understand that notwithstanding above approval, we shall remain fully responsible for the performance of the said sub-contractor and any failure of the sub-contractor shall not absolve/relieve us of our responsibility to complete the works as per the terms and conditions of the Contract.

**NOTE:** Bidders to fill all the details in the above proforma. Further Bidder shall also fill-in the details at Sl.No.5 above based on the estimated value of the proposed work to be subcontracted.



(STAMP & SIGNATURE OF CONTRACTOR)

10) QUALIFICATION STATUS :( TO BE STAMPED BY)

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**CALIBRATION REQUIREMENTS OF MONITORING AND MEASURING DEVICES AT  
CONSTRUCTION SITES**

**[ANNEXURE - VII TO SPECIAL CONDITIONS OF CONTRACT]**

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## CALIBRATION REQUIREMENTS OF MONITORING AND MEASURING DEVICES AT CONSTRUCTION SITES

### Abbreviations

ABS : ABS Consultancy

BIS : Bureau of Indian

Standards BV : Bureau Veritas

CEIL : Certification Engineering International

Ltd DNV : Det Norske Veritas

IRS : Indian Registrar for Shipping

LRS : Lloyd's Register Group Limited



NABL : National Accreditation Board for Testing and Calibration

Laboratories PMI : Positive Material Identification



Requirement for control of monitoring and measuring devices

Sl. No	Description	Calibration requirements	Frequency	Remarks
A.	Civil-Survey			
A.1.	Theodolite	To check for permanent adjustments by traversing and observing the closing error	once in a year or project duration whichever is earlier	Record to be maintained <b>(See note below)</b>
A.2.	Levels	To check by Backsight/ Foresight readings, the temporary adjustments of level	Every use	Record to be maintained <b>(See note below)</b>



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<b>A.3.</b>	Steel measurement tapes	.....	.....	<p>a. "Freemans" make or BIS approved make shall be used.</p> <p>b. Mutilated, or broken tapes shall not be used.</p> <p>c. Marking on the tape shall be legible</p>
<b>A.4.</b>	Cross staff	.....	.....	Same as 3b&3c above
<b>A.5.</b>	Distomat	Actual Physical Verification at Site	Before using first time at site	Records to be maintained
<b>A.6.</b>	Total Station	To check for permanent adjustments by traversing and observing the closing error, etc.	once in a year or project duration whichever is earlier	Record to be maintained (See note below)
<b>B.</b>	<b>Civil Laboratory</b>			
<b>B.1.</b>	All balances- Mechanical	Check for zero error	Whenever used	.....
<b>B.2.</b>	Weigh Batcher/ Batchin g Plant	Calibration of scales	Once in three Months	Records to be maintained



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<b>B.3.</b>	Cube testing machine	Calibration certificate from manufacturers or from reputed calibrating agency.	As per manufacturer specification or once a year whichever is earlier	Records to be maintained
<b>B.4.</b>	Moisture Meter	Calibration of scales	6 months	Records to be maintained

**Note:-**If Error is found, it has to be sent to manufacturers or their authorized agents for rectification and certification. Reputed calibrating agency shall be NABL accredited for relevant testing.

Sl. No	Description	Calibration requirements	Frequency	Remarks
<b>C.</b>	<b>Mechanical/Electrical/Welding</b>			
<b>C.1</b>	Pressure Gauges	Calibration certificate from reputed laboratories or calibrate by dead weight testers with standard weights or with master Gauge	Once in 6 months	Records to be maintained
<b>C.2</b>	Dial Gauges	Check for Zero Error	Whenever used	.....

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<b>C.3</b>	Dead Weight Tester	Calibration from manufacturer or reputed Calibrating agency.  Calibration certificate shall not be older than one month from the date of mobilization.	As per manufacturer's recommendation or once in a six month whichever is earlier.	Records (Calibration certificate) to be maintained	
<b>C.4</b>	Vernier Caliper/ screw gauge	Check for Zero error	Whenever used	.....	
<b>C.5</b>	Holiday Tester	Calibration from manufacturer or reputed calibrating agency or by calibrating by zeep meter.	Once in 6 months	Records to be maintained	
<b>C.6</b>	Elcometer	Check with standard test films supplied by the manufactures	Before use	Records to be maintained	
<b>C.7</b>	Universal Testing Machine	Calibration Certificate from any reputed third party inspection agency. viz, CEIL, LRS, BV, ABS, DNV or IRS	As per manufacturer's recommendation or once a year whichever is earlier	Records to be maintained	

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<b>C.8</b>	Charpy V-notch Impact testing machine	Calibration Certificate from any reputed third party inspection agency. viz, CEIL, LRS, BV, ABS, DNV or IRS	As per manufacturer's recommendation or once a year whichever is earlier	Records to be maintained
<b>C.9</b>	Hardness testing Machine	Check with the standard test block supplied with the machine as per manufacturer's Recommendation	Before use	Records to be maintained
<b>C.10</b>	Chemical Analysis, ex: PMI etc.	Check with the standard samples	Before use	Records to be maintained
<b>C.11</b>	Various Digital and Analog meters	Calibration Certificate from reputed laboratories or the manufacturer	Once in Six Months or as per manufacturer's recommendation whichever is earlier.	Records to be maintained
<b>C.12</b>	Variable current, voltage and resistance generators	Calibration Certificate from reputed laboratories	Once in 6 months	Records to be maintained



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<b>C.13</b>	Temperature/ Pressure Recorders	Calibration from manufacturer or any reputed calibrating agency	Once in 6 months	Records to be maintained
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**Note:-**If Error is found, it has to be sent to manufacturers or their authorized agents for rectification and certification. Reputed calibrating agency shall be NABL accredited for relevant testing.

Sl. No	Description	Calibration requirements	Frequency	Remarks
C.14	Temperature gauges	Calibration Certificate from reputed laboratories	Once in 6 months	To be discarded in case of damage or malfunctioning
C.15	Thermocouples	Manufacturer's Certificate or Chemical Check	.....	.....
C.16	Vibration probes	Calibration from reputed laboratory	Once in a year	To be discarded in case of damage or malfunctioning
C.17	Decibel-meter	Manufacturer's Certificate or Chemical Check	Once in a year	- do -



**Note:-**If Error is found, it has to be sent to manufacturers or their authorized agents for rectification and certification. Reputed calibrating agency shall be NABL accredited for relevant testing.

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**MANGALORE REFINERY & PETROCHEMICALS LTD. CONTRACT WORKER'S SAFETY  
POLICY**



**[ANNEXURE VIII TO SPECIAL CONDITIONS OF CONTRACT]**

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<b><u>CONTRACT WORKER'S SAFETY POLICY</u></b>		

### 1. SCOPE :

This policy is applicable to all the contractors and their employees working in MRPL. This is also applicable to sub-contractors, suppliers, vendors and visitors. All the contractors are required to ensure that they and their employees comply with relevant safety requirements as mentioned in this Safety Policy depending on the nature of work. This policy is not a substitute to the statutory rules and regulations and also the prevailing MRPL Safety Requirements. This is to further reinforce the existing Safety Standards in Refinery.

### 2. REFERENCE : This document should be read in conjunction with following :



- General Conditions of contract (GCC)
- Special Conditions of Contract (SCC)
- Job specifications

### 3. SAFETY REQUIREMENTS FOR CONTRACTORS:

- Contractor shall furnish Safety policy and Safety Manual of their Company and his track record in safety for past three years to the Engineer Incharge.

Contractor shall furnish details of their safety department with CVs of safety officers in his bid document to Engineer Incharge.

- The contractor MUST employ Qualified Safety Officers as per the table below, having about 5 years of relevant experience in chemical units or Petrochemical Plants or refineries, as per The Factories Act 1948 / Building and other construction workers (Regulation of Employment and conditions of service) Act 1996 and Central Rules 1998 / The Karnataka Factories Rules 1969. Contractor shall ensure that all his workmen are aware about the nature of risk involved in their work and have adequate training for carrying out their work safely. Such Safety Officers appointed shall be dedicated and responsible only for safety. They should not be given any other responsibility. The contractor and his sub-contractor, if any, shall comply with the instructions given by MRPL Engineer In- Charge or his authorized nominee regarding safety precautions, protective measures, house-keeping requirements etc. Engineer-In-Charge from MRPL shall have the right to stop the work of the contractor, if in his opinion, proceeding with the work will lead to an unsafe and dangerous condition. Engineer-In-Charge shall get the unsafe condition removed or provide protective equipment at the contractors

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cost, whichever is applicable.

### Table

Max. no. of employees < 30 experience	One discipline (Engr. / Supervisor) with safety can function as Safety Staff on part time basis.
No. of employees : 30 - 100	One Safety Supervisor on full time responsibility.
No. of employees : 101 - 250	<p>For Manpower Supply - Oriented Maintenance contract One Safety Supervisor on full time responsibility.</p> <p>For Service - Oriented Maintenance / Project contract One Safety Engineer on full time responsibility + One Safety Supervisor on full time responsibility</p>



Upto 250 Persons deployed by him at site

Deploy one Safety Officer and additionally deploy Three Safety Supervisors

For 251 to 500 Persons	Two Safety Officers, Six Safety Supervisors and Ten Safety Stewards
For more than 500 persons Twenty	Three Safety Officers, Ten Safety Supervisors and Safety Stewards

Qualification criteria of safety officer:

BSc (Physics Chemistry only)/Diploma (Mech/Elect/Civil only) with post graduate  
Diploma in Industrial safety with min of 5 years experience in supervisory cadre.

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OR



BE/BTech (Mechanical/Electrical/Civil only) with post graduate Diploma in Industrial safety with min of 2 years experience in supervisory cadre.

Qualification criteria of safety supervisor:

BSc (Physics Chemistry only)/Diploma (Mech/Elect/Civil only) with qualification in industrial safety with relevant experience.



#### 4. PERSONNEL:

- Personnel / workmen (age 18 years & above) deployed at site should be physically / medically fit. Labours/workers shall not bring children/babies inside the refinery.
- SMOKING IS STRICTLY prohibited inside the refinery.
- Contractors and their workmen should restrict their activities to the site allocated to them.
- All contract men shall wear IS make PPEs like gloves, goggles, face shields, full body safety harness, safety belt, Safety Helmets, Safety Shoes etc during the work. They will not be permitted to enter the Refinery without wearing Safety Helmet, Safety Goggles & Safety Shoes. Damaged PPEs shall be taken out from use and disposed off properly.
- The contractor shall ensure that their men do not tamper with the facilities in operation. They shall not operate any Valves/ Switches etc.
- The contractor shall ensure that his workmen do not move around freely inside refinery premises other than the assigned place of work & also do not sleep anywhere (Below piperacks / equipments / trucks / etc.) inside refinery premises.
- The personnel engaged by the Contractor shall maintain good conduct and discipline commensurate with Industrial standard. If in the opinion of the Engineer-in-charge any of the personnel have not maintained good conduct and discipline, the Contractor shall remove such personnel immediately from MRPL premises and provide alternate personnel.
- The contractor Supervisors and Engineers must get themselves conversant with MRPL's Standard Operating Procedures (SOP), safety norms, Rules and Regulations that are in force. They must also be conversant with the MRPL's Emergency Procedures and

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Emergency telephone numbers and should ensure display of same at prominent place.

- Special safety precautions to be taken by the contractor or their personnel working in an operating refinery are given below. The safety procedure may undergo a change from time to time, which will be intimated to the contractor to follow and implement them.
- In addition to the following minimum safety requirements, the contractor must comply with the safety requirements, norms, rules and regulations as per the Factories Act 1948 and Karnataka Factories Rules 1969, OISD Guidelines 207 and other OISD standards / guidelines and Indian Standards.
- The contractor must prepare a detailed “Safety Programme” and submit it to Engineer In-charge of MRPL immediately after the finalization of contract / placing of LOI / order. This will include Safety Policy, Safety Responsibilities at various levels, Formations of Safety Committees and meetings, Method statements, Job Safety Analysis (JSA), Safety inspections, various pre-inspection checklists, Safety manuals, Safety Audits, Emergency Plans, Safety procedures to be implemented for all the activities, deputation of Safety Officers, enforcement of safety practices.
- Contractor shall devise a procedure on Accident Reporting. All accidents including Near Misses and property damages to be reported as per the MRPL’s Accident Reporting Procedure in force. All Accidents including Near Misses to be communicated immediately to Engineer Incharge over  
telephone / verbally / and later submit the accident report. All accidents must be investigated, classified, analysed& comply with the recommendations to avoid its recurrence. Monthly Accident statistics must be developed and circulated. Contractor shall maintain a register of all such accidents.
- During the mobilization, equipments, machines, tools, tackles etc. to be inspected at the site from where it is being mobilized. Damaged ones should be discarded and ensured not mobilized at MRPL site. The statutory checks, inspections and certification is carried out before mobilizing at MRPL site. Necessary repairs and maintenance to be carried out and equipment, machine, tools, tackles etc. is mobilized at MRPL site in working condition. The previous records of maintenance and the competent person’s certificates to be made available during mobilization and submitted to MRPL Engineer Incharge. The equipments, machines, tools, tackles, etc to be tagged and mobilized.
- A Safety Committee must be formed to discuss accidents, Unsafe Acts and Unsafe conditions. This should be chaired by the High ranking Official / Site-In-Charge with equal

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participation both from supervisory and non-supervisory cadres of employees. Engineer In-Charge of MRPL also should be involved in such meetings as an observer. The frequency of meetings shall be once in a month minimum and actions taken to avoid recurrence of Nearmiss, Minor injuries etc.

Circular of the meeting must also be issued to MRPL Engineer Incharge at least one week in advance. Minutes of the meetings to be prepared on the same day and submitted on next day of the meeting.

The contractor shall take all safety precautions during the execution of awarded work and shall maintain and leave the site safe at all times. At the end of each working day and at all times when the work is temporarily, suspended, he shall ensure that all materials, equipment and facilities will not cause damage to existing property, personal injury or interfere with other works of the Refinery. The contractor shall comply with all applicable provisions of the safety regulations, clean up programme and other measures that are in force at the site.

- Safety Inspections of the site to be conducted daily and Safety Audits to be conducted once in three months by a team of Senior Officials of the contractor. Report on findings of such Audit to be submitted to the Engineer Incharge and compliance report of the suggestions on findings to be submitted weekly to Engineer Incharge.



Daily Safety Inspection of jobs and safety audit to be conducted every month and the report and protocol signed by all parties, Contractor's safety officers with signatures of Site Incharges of contractor shall be part of subsequent RA bill.

- Method statement along with Job Safety Analysis to be submitted at least 15 days in advance before starting of any activity.

Prior information of high risk jobs as planned shall be informed with short details of the work, job safety analysis report to the Engineer Incharge at least 48 hours before starting of such jobs.

High risk jobs like fabrication at height, lifting and shifting, erection of equipments etc shall be video recorded by the contractor.

- The contractor shall provide and maintain all lights, guards, fencing, warning sign, caution boards, other safety measures and provide for vigilance as and where necessary or as required by the Engineer-In-Charge or by any duly constituted authority for the protection of workers or for the safety of others. The caution boards shall also have appropriate

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symbols visible during night also.

- Adequate lighting facilities, including emergency lighting, such as floodlights, hand lights and area lighting shall be provided along with ELCBs by the contractor at the site of work with isolation switch known to all at site with proper display, storage area of materials and equipment and temporary

access roads within his working area. The contractor shall obtain written approval of the Engineer- In-Charge to the lighting scheme and place of tapping prior to its installation.

Use of devices like Distress alarm system for all personnel entering into confined space to be mandatory. Biometric attendance of personnel entering confined space should be maintained. Necessary Biometric punch machine to be arranged by the contractor at his own cost for this purpose. Staircases shall have temporary hand rail and guard till permanent handrails are fabricated and installed.



The contractor shall plan his operations so as to avoid interference with the other departmental works, other contractors or sub-contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the Department for safe and smooth working.

The contractor shall be held fully responsible for non-compliance of any of the safety measures, procedures and delays, implications, injuries, fatalities, property damage and environmental degradation and compensation arising out of such situations or incidents. The contractor should device a procedure to maintain head count of his personnel manually or with an installation of punching machine at site and ensure evacuation of his personnel through defined emergency exit in case if situation demands and also during confined space entry.

- Smoking is prohibited in the Refinery / work site / offices.

Consumption of alcohol and any other intoxicating material shall be also treated as safety violation and heavy penalty shall be levied on the main contractor.

- Radiography source and also the Explosives used for controlled blasting will not be permitted to be stored at site. Detailed accident report with photographs to be submitted to factory manager and Engineer In-charge from MRPL immediately.
- Contractor's Vehicles/Engines and approved electrical / mechanical equipments& lifting tools / tackles, welding generator that are to be used inside refinery are to be certified by competent authority. Statutory checks are to be carried out and records are to be maintained by contractors to ensure healthiness. These certificates will be

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regularly checked by MRPL engineer in-charge.

- The Contractor shall ensure that all industrial consumables such as Oxygen, Acetylene, Argon, Nitrogen, welding electrodes etc. are approved by MRPL, tested and records maintained by the contractor as per Gas Cylinder Rules before they are used for the job. LPG for gas cutting purpose is not allowed.
- The Fire prevention / protection and safety equipments (including Personal Protective Equipments) should be certified by MRPL engineer in-charge.

## 5. HEALTH AND HYGIENE:

- Sufficient number of toilets shall be provided by the contractor for its workmen and hygiene standard should be maintained.

Contractor to ensure no water stagnation at site.



Potable water facility for all workers shall be provided and maintained by the contractor.

Inspection of drinking water, sanitation, shall be done by MRPL. Availability of dust masks shall be ensured by the contractor at site.

Contractor to maintain affordable hygienic canteen for the workers.

- The contractor must maintain record of medical examinations of its employees as per The Factories Act 1948 and The Karnataka Factories Rules, 1969 and The Building and other construction workers (Regulation of Employment and conditions of service) Act 1996 and Central Rules 1998. This will include eye test of crane operators, vehicle drivers and all others. Also Fitness certificate by the Medical Officer for working at height to be produced for each employee requiring to work at height.
- Adequate means and personnel for rendering first aid should be readily available at site and during working hours at places where work is carried out.
- Medical aid for First-Aid should be available.
- First Aid kits or boxes, as appropriate, should be provided at the workplaces and on motor vehicles, cranes, etc. and be protected against contamination by dust, moisture, etc.
- When workers are employed underground or beneath structures or pits or other conditions in which they may need to be rescued, suitable rescue equipment like tripod with pulley and safety belt should be readily available at site at or near the work site along with trained





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rescue workers.

## 6. VEHICLE MOVEMENT:

- The contractor shall conduct his operation so as not to interfere with the use of existing roads at or near locations where the work is being performed.
- Speed limit inside the refinery is 16 KMPH which should be strictly followed. For heavy machinery like cranes / forklift / RMC trucks, etc. the speed limit is 5 KMPH maximum.
- Special precautionary measures should be taken during transportation of long sized cargo, route as defined should be followed and for safety of personnel (with proper escort) and damages to the facilities should be avoided. Procedure for vehicle entry and Speed limits in Refinery should be strictly followed. Vehicles and cargos passing through refinery should have PESO approved spark arrestor fitted.
- When interference to traffic is inevitable, notice of such shall be given to the Engineer- In-Charge of MRPL well in advance with the details of start of the work and time required, storage of materials, and details of the proposed methods of providing the required facilities for safe and continuous use of roads and obtain his clearance.
- The contractor shall exercise full care to ensure that no damage is caused by him or his workmen, during the operation, to the existing water supply, sewerage, power or telecommunication lines or any other services or works. The contractor shall be required to provide and erect before starting of the work, substantial barricades, guardrails and warning signs. He shall furnish, place and maintain adequate warning lights, signals etc, as required by the Engineer-In-Charge.
- Vehicles must have green red flags and whistles for the cleaner to guide driver.  
All vehicles entering MRPL premises shall have cleaner / helper.
- The vehicles must be maintained as per the preventive maintenance schedule of the manufacturer / supplier. Only Drivers that are trained in Defensive Driving shall be deployed inside Refinery
- Vehicles to be inspected fortnightly by trained technicians as per the inspection checklist.  
Pre-inspection checklist to be formed to that effect.

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- All vehicles to bear a sticker. “If you notice this vehicle is over speeding then please inform on telephone no 08242882192 / 2191 / 2194 / 2771 / 2731”.
- Tractors and trucks / cranes / forklift should not be used for transporting personnel.
- Every vehicle should have the contractor’s name prominently displayed on Tractor Trolleys, trucks, jeeps, cranes, JCBs, Poclains, trailers. The display board should be put on front and rear side of each of the vehicle.

Tractor trolleys must have independent brake systems both on tractor as well as on trolleys.



- All vehicles must be fitted with PESO approved spark arrestors.

Tippers/trucks carrying debris and soil/mud/sand shall ensure that there is no spillage of material on road. If any such spillage observed the same need to be cleaned and cleared by the contractor immediately. Wheels of the trucks and vehicles shall be clean and free from mud.

- Contractor to maintain Inspection and maintenance logs for every vehicle.
- Any kind of repair work on contractor’s vehicle is to be carried out only inside the work shop or designated place and not allowed inside the battery area or any where at on road or at site.

## 7. SAFE MEANS OF ACCESS :

- The contractor must possess adequate numbers of self retractable type fall arrestors (of different sizes viz. 6m, 20m, 40m, and 60m), Safety nets and Safety Belts (Full Body Safety Harness) (ISI approved).
- Adequate and safe means of access and exits shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevation shall not be permitted.
- Suitable scaffolds shall be provided for workmen for all works that cannot be done safely from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made of metal and all ladders shall be maintained well for safe working condition. If the ladder is used for carrying materials as well, suitable foot holds and handholds shall be provided on the ladder. Ladders shall not be used for climbing carrying materials in hands. While climbing both the hands shall be free. Ensure positioning of person at base / grade level while it is in use. All ladders, platforms, full body safety harness and



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safety nets should be inspected regularly and records should be maintained. Damaged items shall immediately be taken out of service and disposed off.

- Scaffolding staging more than 1.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support and ladder shall conform to relevant IS specification. Timber bamboo scaffolding is not allowed inside the Refinery.
- Working platforms of scaffolds shall have toe boards 15cms in height to prevent materials from falling down.
- A sketch of the scaffolding proposed to be used shall be prepared and approval of the contractor's Mechanical Engineer obtained prior to start of erection of scaffolding. All scaffolds shall be examined and certified with proper display of tags by contractors Mechanical Engineer before use.
- Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9m in length. For ladders upto 3m in length the width between side rails in the ladder shall in no case be less than 300mm. For longer ladders this width shall be increased by atleast 20mm for each additional metre of length. Step shall be uniform and shall not exceed 300mm.
- Working platform and gangway along the side of pipe racks shall be provided. Under no circumstance the contractor employees should step on pipes at pipe racks.

#### **8. EXCAVATION, TRENCHING AND EARTH REMOVAL :**

- A Work Permit must be taken for any excavation or earth removal inside the existing refinery premises from Engineer In-Charge MRPL, as the area of work has underground pipelines, cables etc.
- All trenches 1.2m or more in depth shall at times be supplied with at least one ladder for each spacing of 3.0m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1m above the surface of the ground.
- The sides of the trench which are 1.2m or more in depth shall be stepped back to give suitable slope (angle of repose) or securely held by timber bracing (i.e. shoring of the excavated trench or pit should be done), so as to avoid the danger of sides from collapsing. The excavated material shall not be placed within 2m of the edges of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances under-cutting shall be done.
- The contractor shall ensure the stability and safety of the excavation, adjacent structures,

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services and the works.



- Open excavations shall be fenced off by railing (ledger pipes) and warning signals installed at well-lit places so as to prevent persons falling into the excavations.
- All blasting operations shall be carried out on the basis of procedures approved by Inspector of explosives. All works in this connection shall be carried out as per IS code of practice. Barricades, Warning signs etc. shall be placed on the roads / open area. Prior approval of such operation shall be obtained from Engineer-In-Charge of works. The blasting procedure being followed by the contractor must be submitted with MRPL engineer in-charge.
- The contractor must submit the methodology, safety aspects, schedule, License and other relevant features of control blasting operations.
- Wherever manual removal of earth is involved, earth shall be removed from the top by maintaining the proper slope equal to the angle of re-pose of the earth. Manual removal of earth / lowering of person in a pit should be done with tripod and pulley besides use of Full body Safety Harness by person.
- Such work shall be constantly supervised by the contractor's responsible persons.

## 9. DEMOLITION:

Before any demolition work is commenced and also during the progress of the work :

- Proper approvals shall be taken from Engineer in-Charge MRPL before commencing demolition.
- Area around shall be barricaded with cautionary signs and posting of security guards or supervisors for preventing unauthorised entries of personnel.
- All roads and open area adjacent to the work site shall either be closed or suitably protected.  
Appropriate warning signs shall be displayed for cautioning approaching persons.
- No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.
- Entries to the demolition area shall be restricted to authorized persons only.



Contractor to place separate collection facility of waste like metal, on metal non degradable and bio degradable wastes and shall dispose to designated place daily basis.

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Contractor shall be responsible to clear dry grass and wooden items etc from and around his working site/storage/fabrication yard etc to prevent any fire accidents.

#### 10. PERSONAL PROTECTIVE EQUIPMENTS:



- All proper “ISI” marked Personal Protective Equipments (PPEs) as considered necessary by the Engineer-In-Charge shall be kept available by contractor for the use of the persons employed on the site and maintained in a condition suitable for immediate use. Also the contractor shall take adequate steps to ensure proper use of equipment by those concerned. The PPEs are to be provided by the contractor.
- All persons employed at Refinery shall use safety helmets, safety shoes and safety goggles as minimum safety gears. For other types of works, persons working in that area shall also use the required PPEs, as advised by the Engineer-In-Charge of MRPL.
- Workers employed on mixing asphaltic materials, cement and lime mortars shall use Gumboots, safety goggles, hand gloves and proper respirator.
- Persons engaged in welding and gas-cutting works shall use suitable welding face shields with welder’s helmet. The persons assisting the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- Stonebreakers shall use protective goggles. They shall be seated at sufficiently safe intervals or distance.
- Persons engaged in or assisting in shot blasting (Sand blasting is prohibited) operations and cleaning the equipment after shot blasting shall use suitable gauntlets, overalls, dust mask, dust proof goggles, safety shoes and protective hood supplied with fresh air.
- All persons working with 3M lifeline and hook at height above ground or floor and exposed to risk of falling down shall use safety belts (Full Body Safety Harness with double life line and scaffolding hooks, ISI marked) which should be properly secured to solid object unless otherwise protected by cages, guard railings, etc. In places where the use of full body safety harness is impractical, suitable safety net of adequate strength fastened to substantial supports shall be employed under proper valid permit.
- When workers are employed in sewers and inside manholes, which are in use, the contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. The atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the confined space entry permit, availability of

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standby person at manhole must be ensured before the personnel are allowed to get into the man-holes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards or barricade tape to prevent accidents. There shall be proper illumination in the night.

## 11. PAINTING:

- Respirators shall be provided by the contractor for use when paint is applied, safety of personnel in vicinity also should be considered while painting.
- Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the painters for decontamination at the cessation of work.
- All solvent-based paints, thinners shall be stored in separate well ventilated storage kept under proper surveillance.
- Smoking, open flames or sources of ignition / hot work shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national / regional language, “SMOKING / HOT WORK - STRICTLY PROHIBITED” shall be displayed in the vicinity where painting is in progress or where paints are stored. Symbols shall also be used for caution boards.
- Suitable IS marked First Aid Fire Fighting equipments shall be kept available at a place where flammable paints are stored, handled or used.
- When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. Workers shall wear suitable supplied air type breathing apparatus. Work shall be carried out under a valid work permit.
- Epoxy resins and their formations used for painting shall not be allowed to come in contact with the skin. The workers shall use PVC gloves and / suitable barrier creams.
- Adequate ventilation shall be provided especially when working with hot resin mixes.
- Increased personal hygiene shall be practiced to control inadvertent contact with the resin and eliminate its effects.
- Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.

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- Care must be taken while carrying out painting inside confined space. There shall be safety devices to monitor the personnel working inside confined space like vessels during painting of internal surface. Suitable painting methods shall be adopted as specified elsewhere. It should not be clubbed with hot work and proper ventilation should be available to draw out the solvent vapours. Manual painting is to be adopted instead of spray painting.

## 12. LIFTING MACHINES TOOLS AND TACKLES:

- Supplier's / Manufacturer's manual for operations / safety / periodical maintenance of all Cranes, winches, JCBs, Poclains, Excavators, Trucks, tractors, Vehicles, etc. MUST be made available at site from the moment it is brought at site and the same should be strictly adhere to.
- Lifting machines, tools and tackles shall be of good mechanical construction, sound material, adequate strength, free from any defects and shall be kept in good working condition.
- Lifting machines, tools, tackles, equipments etc. to have identification tags of steel plate of size 2"x 2" tied to it using steel wire of 4 mm size. The details like reference number, Safe Working Load (SWL), date of testing, next due date of testing, etc. to be punched on this plate.
- Contractor must produce Competent Authority's (Authorised by The Directorate of Factories, Karnataka state) Certificate of testing in the prescribed form of Lifting Machines, Chains, ropes and lifting tackles well in advance. Only valid Lifting Machines, tools etc. to be used and to be re-certified before expiry of certificate. Also, these equipments will be inspected by Engineer In-Charge of MRPL as and when required. The same procedure is applicable for all other Electrical Equipments, tools, machines, D.G sets, compressors, etc.

Lifting equipments for testing by competent authority to include JCB, Poclain,

Excavators, etc. The ringer crane to be tested and certified every time by Competent



Person it is dismantled and reassembled. This certification must also include stability

of soil on which it is assembled.



Use of Hydra is not permitted inside refinery/construction premises. Hydraulically jacked lifting machines to be used.

- Lifting machines, tools, tackles, equipments etc. to be inspected in addition to the Competent Authority's certification. This should be done fortnightly by experienced trained mechanical foreman and technicians and record of such inspection to be maintained.



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- Every rope and sling used in hoisting or lowering of materials or as a means of suspension shall be of good quality and adequate strength and free from any defect.
- Every crane operator or lifting appliance operator shall have a driving License for Heavy Vehicle, proper physical fitness such as eye sight etc. and with adequate experience. No persons under the age of 21 years shall be in charge of any hoisting machine or give signal to operator of such machine.
- In case of every lifting machine (and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or as means of suspensions) the safe working load shall be ascertained and clearly marked. In case of a lifting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load.
- The contractor shall notify the safe working load of the machine to the Engineer-In- Charge whenever he brings any machinery to site for work and get it verified by the Engineer-In- Charge, supported by a valid test certificate by the competent person.
- Motors, gearing transmission, couplings, belts, chain drives and other moving parts of hoisting appliances shall be provided with adequate safeguards. Hoisting appliances shall be provided with such means as to reduce to the minimum risk of any part on a suspended load becoming accidentally displaced or lowered.
- The contractor must have a team of Experienced Mechanical Personnel (having minimum of 5 yrs. experience in carrying out safety inspection and testing of Lifting machines, Tools and Tackles etc.), to conduct periodical (Daily, fortnightly, monthly and quarterly) inspection and testing of Lifting machines, Tools and Tackles and to maintain its records.
- Crane shall not be used as hoist. In case cranes are used as hoist then factory Inspector's permission to be taken in advance and to be subject to biannual testing by competent person as required for hoist under Factories Act 1948. Also, the design of cage to be got approved by the competent person well in advance. Two ropes or chains to be provided to the cage, separately connected with the cage, suspended independently and capable of carrying the whole weight of the cage.
- Contractor to maintain operation, inspection and maintenance logs for every lifting equipment, tool and tackle.



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### 13. TEMPORARY SHEDS :

- Before erecting temporary shelters like sheds or tents anywhere at site, written permission of th  
e concerned Engineer In-charge must be obtained.
- Temporary sheds for site office should be avoided. Instead contractor shall arrange for portal cabins for site office / stores.
- Temporary shed should not be erected using scaffolding pipes. The shed should be made of safe construction material.
- The temporary shed should be erected after proper designing following engineering design practices in conformance with normal safety standards to ensure the stability and safety.
- Temporary shed should bear the contractor's name.
- Temporary piping, hose connections and electrical wiring to these temporary sheds must be laid in such manner that they do not cause tripping, hitting or electrocution hazards.

### 14. ERECTION:



- At the planning stage consideration should be given, by those responsible for the design, to the safety of the workers who will subsequently be employed in the erection of such structures. A detailed erection scheme / schedule shall be furnished well in advance for all the critical erections.
- Care should be exercised by design engineers and other professional persons, not to include anything in the design which would necessitate the use of unwarrantably dangerous structural procedures and undue hazards, which could be avoided by design modifications.
- Facilities should be included in the design for such work to be performed with the minimum risk.
- Detailed Safety Procedure should be submitted as a part of Heavy Equipment erection

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scheme.

Heavy Equipment erection scheme must be submitted at least one month in advance.



- Erection engineer to conduct training on rigging before every heavy lift / erection for crane operator, foreman and riggers.
- Erection of structural platforms, gratings and hand rails to be done on priority. The procurement of gratings, structural members for hand rails to be done on priority.
- Prefabricated parts should be so designed and made that they can be safely transported and erected.
- As far as practicable the safety of prefabricated parts while erection should be ensured by appropriate means, such as provision and use of:
  - a) Ladders;
  - b) Gangways;
  - c) Fixed platforms;
  - d) Platforms, Buckets, boatswain's chairs, etc. suspended from lifting appliances;
  - e) Safety belts and lifelines; and
  - f) Safety nets or catch platforms.
- Ladders to be inspected fortnightly by experienced trained mechanical foreman and mechanical technicians and record of such inspection to be maintained.
- The boatswain's chairs/ platforms used in structural erection to be inspected and checked once in fortnight and record maintained.
- In addition to the conditions of stability of the part when erected, when necessary to prevent danger the design should explicitly take into account:
  - a) The conditions and methods of attachment in the operations of stripping, transport, storing and temporary support during erection; and
  - b) Methods for the provision of safeguards such as railings and working platforms, and, when necessary, for mounting them easily or prefabricated parts.

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- The hooks and other devices incorporated in prefabricated parts that are required for lifting and transporting them should be so shaped, dimensioned and positioned as:
  - a) To withstand with a sufficient margin the stresses to which they are subjected; and
  - b) Not set up in the part stresses that could cause failures, or stresses in the building not provided for in the plans.
- Prefabricated parts made of concrete should not be stripped before the concrete has set and hardened sufficiently to ensure the safety of the operation.
- Store places should be so constructed that:
  - a) There is no risk of prefabricated parts falling or overturning; and
  - b) Storage conditions generally ensure stability having regard to the method of storage and atmospheric conditions.
- Prefabricated parts made of concrete should not be erected before the concrete has set and hardened to the extent provided for in the plans.
- While they are being stored, transported, raised or set down, prefabricated parts should not be subjected to stresses prejudicial to their stability.
- Trailers only to be used for transportation of pipes. Crane to be used for erection at site.
- Every lifting appliance should :
  - a) Be suitable for the operation; and
  - b) Be approved by a competent person, or tested under a roof load 20 percent heavier than the heaviest prefabricated part.
  - c) Ringer mode of a heavy crane **MUST** be inspected, checked and certified by competent person every time it is dismantled and erected. The report must bear the stability of the soil on which it is erected.
- Lifting hooks should have the maximum permissible load marked on them.
- Tongs, clamps and other appliances for lifting prefabricated parts should:
  - a) Be of such shape and dimensions as to ensure a secure grip without damaging the part; and
  - b) Be marked with the maximum permissible load in the most unfavourable lifting conditions.

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- Prefabricated parts should be lifted by methods or appliances that prevent them from spinning accidentally.
- The temporary basket cages / Platforms / Buckets / boatswain's chairs, etc. used for lifting / working at height suspended from lifting appliances or suspended from structures or beams **MUST** be certified by competent person and provisions or conditions as stipulated during certification to be adhere to.
- While prefabricated parts are being lifted measures should be taken to prevent workers from being struck by objects falling from a height and area around such site should be barricaded with cautionary signs.
- When necessary to prevent danger, before they are raised from the ground, prefabricated parts should be provided with safety devices such as railings and working platforms to prevent falls of persons.
- If workers are exposed to danger when releasing prefabricated parts from lifting appliances, adequate safety measures should be taken.
- At workplaces adequate instructions should be given to the workers on the methods, arrangements and means required for the construction, storage, transport, lifting and erection of prefabricated parts.
- When it is not practicable to install protective guardrails and toe boards the workers should be provided with and use safety belts and lifelines to limit the height of the fall.
- Overhead screens to be provided to prevent workers from being struck by falling objects.
- The safety devices (guard-rails, toe-boards, safety belts and lifelines) should not be removed so long as the risk remains.
- Precautions should be taken to prevent fires being caused by rivet-heating equipment.
- Rivet heaters should extinguish their fires before leaving work.
- Extra care should be taken to prevent fall of objects, tools, etc. from height.



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- Before structural steel parts are lifted, care should be taken that any object that could fall is fastened or removed.
- Structural steel parts should not be dragged while being lifted if that could cause danger.
- Steel trusses that are being erected should be adequately shored, braced or guyed until they are permanently secured in position.
- While structural members are being moved into place the load should not be released from the hoisting rope until the members are securely fastened in place.
- Structural members should not be forced into place by the hoisting machine while any worker is in such a position that he could be injured by the operation.
- No load should be placed on open-web steel joists until they have been placed in position and secured.
- Erection of pipes to be done using web belts only. Web belts must be inspected and checked fortnightly internally by the contractor and records maintained. Damaged ones to be cut to pieces and record to be maintained.
- Nipples and other accessories used for hydrotest and subject to high pressures to be inspected, checked and tested by experienced trained mechanical foreman and mechanical technicians and records maintained. Damaged parts to be replaced immediately with the new ones.
- Discarding criteria of web belts to be procured from the supplier / manufacturer by the contractor and submitted to MRPL Engineer Incharge.

## 15. WORK ON TALL CHIMNEYS:



### SCAFFOLDS :

- All workmen should be certified medically fit by medical practitioner before working at height. Mock up drills MUST be conducted by the contractor for all these workmen and issue Working at Height passes to only those who has experience of working at height, is declared medically fit and shows confidence during mock up drills.

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- For the erection and repair / painting of tall chimneys and vertical structures scaffolding should be provided. Scaffolds after erection should be certified by competent mechanical engineer for its strength before use and be displayed with a tag “Certified for use”.
- Scaffolds should confirm to relevant Indian Standards. Contractor MUST have a team of trained scaffolders including trained Scaffolding engineer.
- Fixed inside scaffolding should be securely anchored in the chimney wall.
- The scaffold floor should always be at least 65 cm (26 in) below the top of the chimney.
- Under the working floor of the scaffolding the next lower floor should be left in position as a catch platform.
- Suspended outside platform (inspection scaffolds) should be provided as per the relevant standards as stated above.
- Use of Catch platforms, stairs, ladders and Iron rung, lifting tools, tackles and work with hot asphalt, tar should be carried out as per the procedures outlined in relevant ILO manual.
- Full Body Safety Harness (Safety Belt) with lifelines (of various sizes 2’, 5’ and 9’ double lanyards) and safety nets being used should confirm to relevant standards and are to be inspected, tested, periodically and records be maintained. Damaged safety belts and nets should be discarded, taken out of service and disposed off.
- Safety belts must be used while working at height. The life lines (lanyard) MUST be tied to firm support. In case of absence of firm support provision of wire rope of adequate size tied with lifting tackles to be made to tie the safety belt life line (lanyard).
- All Safety belts to be inspected once in a month and damaged ones to be discarded. Suppliers /Manufacturers Discarding criteria of safety belts to be submitted to MRPL. The record of inspection and the results to be maintained. And a copy to be submitted to Engineer Incharge.
- The scaffolds to be inspected and certified by the competent mechanical Engineer before use and subsequently, at least once in a week.



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## 16. SAFETY OF ELECTRICAL WORKS:

Before starting work in live electrical panels, proper electrical isolation shall be ensured. The same to be inspected by the electrical in charge and necessary isolation tag shall be attached. Proper electrical isolation permit system along with LOTO (Locking Out / Tagging Out) system shall be maintained by the contractor. Triplicate copy of such permits shall be submitted to MRPL.

## 17. CATCH NETS:

- Where workers cannot be protected against falls from heights by other means they should be protected by catch nets.
- Catch nets should be made of good quality fiber cordage, wire or woven fabric or material of equivalent strength and durability.
- The perimeter of catch nets should be reinforced with cloth-covered wire rope, manila rope or equivalent material.
- Catch nets should be provided with adequate means of attachment to anchorage.
- Catch nets to be inspected fortnightly, tested and records maintained. Damaged safety nets should be discarded and record maintained.

## 18. PROTECTION AGAINST MOVING VEHICLES:



Workers who are regularly exposed to danger from moving vehicles should wear;

- a) Distinguishing clothing, preferably bright yellow or orange in colour; or
- b) Devices of reflecting or otherwise conspicuously visible material.

Light Vehicle shall have reverse horn and Heavy Vehicles shall have trained helpers with whistle and red and green flags for directing the driver.

## 19. HANDLING MATERIALS:

- Mechanical means should be provided and used for lifting and carrying loads.

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- Personnel should have knowledge of safe ways of material handling.

## 20. STACKING AND PILING:

- Materials and objects should be so stacked and unstacked that no person can be injured by materials or objects falling, rolling, overturning, falling apart or breaking.
- Area earmarked for stacking and piling should be barricaded and only authorised personnel be allowed to carry out stacking and piling jobs.
- Proper stacking and piling should be done as per the guidelines of ILO.

## 21. WELDING AND GAS CUTTING:

- Welding and gas cutting operations shall be done only by qualified and authorised persons and as per IS specification and code of practice.
- All the hoses used on compressed gas cylinders (Acetylene, Oxygen etc.) to be as per IS.
- Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of flammable / gaseous mixtures. Contractor shall continuously monitor the area with Explosimeter / H2S meters.
- Welding and gas cutting equipments including hoses and cables shall be maintained in good condition. It should be checked daily by the user and fortnightly by the supervisor and recorded.
- Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is done in elevated positions / on trenches / inside refinery units, precautions shall be taken to prevent sparks or hot metals falling on persons or flammable materials (Welding booths shall be constructed).
- Use of proper PPEs by personnel involved in Gas cutting / Electric Arc welding should be ensured.  
Use of Welders Helmet with face shield by the welders is a MUST.

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- Fire extinguisher shall be available near the location of welding operations. Valid permit shall be obtained before flame cutting / welding is taken up & comply with all the permit requirements.
- Contact of personnel with the electrode or other live parts of electric welding equipment shall be avoided.
- Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
- The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that movement of materials does not damage the cables.
- Oxy-Acetylene cylinders must be mounted on trolley with chain holding the compressed gas cylinders. The compressed gas cylinders must have pressure gauges fitted over it and Oxy- Acetylene Gas cutting set should be fitted with flash back arrestor at both the torch and cylinder ends.
- Under no circumstance the compressed gas cylinder should be taken inside the confined space or excavated pits. Hydraulic test certificates of all compressed gas cylinders should be maintained and furnished as and when required.

## 22. GRINDING:

- All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- Grinding wheels of specified diameter only shall be used on a grinder - portable or pedestal- in order not to exceed the prescribed peripheral speed.
- Helmet with face shield shall be used during grinding operation.

## 23. HOUSE KEEPING:

The contractor shall at times keep his work spot, site office and surroundings clean and

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tidy from rubbish, scrap, surplus materials and unwanted tools and equipment.



- Welding and other electrical cables shall be routed as to allow safe traffic by all concerned.
- No materials on any of the sites of works shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Engineer-In-Charge may require the contractor to remove any materials which, are considered to be of danger or cause inconvenience to the public.
- At the completion of the work, the contractor shall have removed from the work premises all scaffoldings, surplus materials, rubbish and all sheds and sanitary arrangements used / installed for his workmen on the site.
- House keeping of the workplace shall be done strictly by the Contractor on daily basis or as required by the Engineer-in-charge. Contractor to collect all debris/ scrap and dump at designated Scrap Yard as defined by MRPL authorities.
- A separate house keeping team to be formed and made available round the clock.

#### 24. FIRE SAFETY:

- Adequate number of duly calibrated Explosimeters, Oxygen meters, Hydrogen Sulphide detectors (Portable / Fixed) or any other multiple gas detector should be made available at site by the contractor.
- Combustible materials like timber, bamboos, paints etc. shall not be used at MRPL site for scaffolding or for supports.

Containers of paints, thinners and allied materials shall be stored in a separate room, which shall be well ventilated, and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be covered or properly fitted with lid shall not be kept open except while using.

- Fire extinguishers as approved by Engineer-In-Charge shall be located at the work site at appropriate places.

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- Adequate number of contract workmen shall be given education and training in fire fighting and extinguishing methods.

## 25. WORK PERMIT SYSTEM:

- MRPL's Work Permit system (As per MRPL Safety Manual) to be strictly followed.
- All jobs within refinery should be executed with a safety work permit only. These will be issued by the concerned operating personnel of MRPL (Refinery Shift Manager or any authorised person).

However, he can withdraw the permit when the stipulated conditions are not complied with at the work spot.



- Area is safe for performing the Work. Job is continuously supervised by qualified supervisor.

Responsibility of Performing Authority:

To obtain an approved Work Permit duly filled and signed by authorities as per the MRPL's Work Permit System before starting the work in the area.

- To visit job sites and ensure that it is prepared accordingly.
- The person performing the job shall be in possession of the permit till the completion of the job. The permit should be produced for inspection at any time. The Work Permit shall be displayed at job site in the plastic folder.
- To understand the scope of the work and implications involved.
- To restrict the work to the area / equipment specified in the work permit.
- To comply with the instructions given on the Work Permit.
- To follow Plant Safety Rules and Procedures.
- To be alert at all times for the development of unexpected situations.

To stop the work immediately on detecting any unsafe condition and promptly inform the Issuing Authority. Follow MRPL's Onsite Disaster Management Plan (DMP).

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- To return the Permit duly signed after completion of the job to the Issuing Authority. Contractor must adhere to work permit system and other safety regulations.

## **26. WORK IN AND AROUND WATER BODIES:**

When the work is done near any place, where there is a risk of drowning, all necessary rescue equipment such as life buoys and life jackets shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work. Persons who do not know swimming shall not be engaged alone for any work where risk of drowning exists. Sufficient number of life buoys or life jackets shall be provided.



## **27. PUBLIC PROTECTION:**

The contractor shall make all necessary provisions to protect the public. He shall be bound to bear the expenses for defense of every action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of any precaution required to be taken to protect the public. He shall pay the damage and cost which may be awarded in any such suit, action or proceedings to any such person, or the amount which may be fixed as a compromise by any such person.

## **28. OTHER STATUTORY PROVISIONS:**

Notwithstanding the above clauses there is nothing in these to exempt the contractor from the provisions of any other Act or Rules or Indian Standards or OISD standards or OISD guidelines in force in the Republic of India. In particular all operations involving the transport, handling, storage and use of explosives shall be as per the standing instructions and conform with Indian

Explosives Act, 1884 and the explosives Rules, 1983. The Factories Act 1948 and The Karnataka Factories Rules, 1969, Handling, transport, storage and use of Compressed gas cylinders and Pressure vessels shall conform with the Gas Cylinders rules 1981 and Static and Mobile pressure Vessels (Unfired) Rules 1981. In addition, The Building and other construction workers (Regulation of Employment and conditions of service) Act 1996, The Indian Electricity Act, 1910 and Indian Electricity Rules 1956, The Atomic Energy Act 1962, The Radiation Protection Rules 1971, Radiation Protection Manual of Nuclear Facilities and the Atomic Energy (Factories) Rules 1988 and various rules and Act relevant to the activities being performed shall also be strictly complied with.

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- No Child labour should be brought in for work.
- MRPL holds the right to issue warnings / Heavy penalties (monetary fine) / suspend work at any time or terminate the contract for a loss / damage and a pattern of frequent failure to adhere to Safety Laws, regulations and Onsite Safety procedures. In general a heavy monetary fine will be deducted straight from the contractor's bill for each violation of Safety Rules / Unsafe Act / Unsafe Condition observed, for each First-Aid injury, for each Lost Time injury / Near Miss Accident and for each fatality.

## **29. GUIDELINES AND GENERAL PROCEDURES FOR SUPPLY AND USE OF ELECTRICITY AT SITE:**



Following safety requirements shall be complied with before the contractor uses the power supply.

- The contractor shall submit a list of licensed electrical staff to be posted at site
- It shall be the responsibility of the contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-In-Charge / Electrical Engineer.
  - a) Indian Electricity Act, 1910
  - b) Indian Electricity Rules, 1956
  - c) National Electric code, 1985
  - d) Other relevant rules of Local bodies and Electricity Boards.
- Where distribution boards are located at different places the contractor shall submit schematic drawing indicating all details like size of wires, overhead of cable feeders, earthing etc. The position and location of all equipment and switches be given.
- The contractor shall make his own arrangements for main earth electrode and tapings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant I.S. Specifications.





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- Overhead High Tension (HT) cable routes to be marked and physically barricaded to prevent crane coming in contact with it.
- All three-phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.
- All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection.  
Neutral conductor shall not be treated as earth wire.
- Every electrically operated machine or equipment to be independently earthed.
- Earth pits to be provided near DG sets, electrically operated machines, equipments etc.  
DG sets used in Refinery shall be installed inside acoustic enclosure to minimise noise pollution. Exhaust of DG sets shall be routed to safe height.
- Continuity and resistance of all earth connections to be inspected and checked and tested fortnightly and records to be maintained.
- The contractor shall not connect any additional load without prior permission of Departmental Electrical Engineer.
- Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed.  
However, tapings from an earth bus may be done.
- The entire installation shall be subjected to the following tests before energisation of installation including portable equipment:
  - a) Insulation resistance test
  - b) Polarity test of switches
  - c) Earth continuity test
  - d) Earth electrode resistance
- The test procedures and their results shall conform to relevant IS specifications. The

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contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.

- Only persons having valid wireman's license shall be employed for carrying out electrical work and repair of electrical equipment installation and maintenance at site. The job shall be supervised by a qualified licensed supervisor.
- Electricians to be provided with red helmet for easy identification.
- Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant Indian Standards.
- The minimum clearance to be maintained for all overhead lines along roads and across roads shall be as per the statutory requirements.
- Grounding conductor of wiring system shall be of copper or other corrosion-resistant material. An extra grounding connection shall be made in appliances / equipment where chances of electric shock is high.
- Electric fuses and / or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses are used in all circuits. The Earth Leakage Circuit Breaker (ELCB) of 30mA max capacity shall be provided in the circuits. (ELCB) of 30mA max shall be provided on each Extension board.
- Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables / wire and earthed effectively. Metallic poles as a general rule, shall be avoided and if used shall be earthed individually. Anticlimbing guards and danger notices shall be provided on poles. Each equipment shall have individual isolating switches.
- Wires and cables shall be properly supported and an approved method of fixing shall be



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adopted. Loose hanging of wires and cables shall be avoided. Lighting and power circuits shall be kept distinct and separate.

- Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid underground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC) tile or any other approved means and provided with cable markers.
- All armored cables shall be properly terminated by using, suitable cable glands. Multi-stranded conductor cables shall be connected by using cable lugs/sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- All cable glands, armoring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.
- All the Distribution Boards, switches, fuse units, bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and water proof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible, change shall be done only after the approval of the Departmental Electrical Engineer. Distribution Boards used inside the process units shall be of Flame Proof type (Intrinsically safe type).
- Each Distribution Board shall have ELCB of 30mA max capacity.
- The contractor shall provide proper enclosures / covers of approved size and shape for protection of all the switchboards, equipment etc. against rain. Exposed live parts of all electrical circuits and equipment shall be enclosed permanently. Crane trolley wires and other conductors which cannot be completely insulated shall be placed such that they are inaccessible under normal working conditions.
- Iron soclad industrial type plug outlets are preferred for additional safety.



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- Open type Distribution Boards shall be placed only in dry and ventilated rooms; they shall not be placed in the process units, vicinity of storage batteries or otherwise exposed to chemical fumes.
- Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.
- In front of distribution boards a clear space of 90cm shall be maintained in order to have easy access during emergency.
- Adequate working space shall be provided around electrical equipment, which require adjustment or examination during operation.
- As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in workroom where there is possibility of explosion hazard shall be explosion proof.
- All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed. Electric starter of motors, switches shall not be mounted on wooden boards. Only sheet mounting or iron framework shall be used.
- All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.
- Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections.
- Taped joints in the wires shall not be used. In case joints are required on electrical cables then only heat shrinkable PVC sleeves will be allowed.
- The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakages. Only 24V supply system shall be used for hand



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lamps etc. while working inside metallic tanks or conducting vessels (Confined spaces).

- After installation of new electric system and or other extensive extensions to existing installations, thorough inspection shall be made by Contractor's Electrical Engineer before the new system or new extension is put in use.
- All persons who work with electrical installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques, location of isolation switches, etc.
- The supervisor shall instruct the workers in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden ladders shall be used to reach the heights in electrical work.
- No material or earthwork shall be allowed to be dumped below or in the vicinity of the bare overhead line conductors.
- Separate work permits shall be issued for individual group leaders working on the same system which shall be returned after the completion of the work to the Engineer-In-Charge.
- Before any maintenance work is commenced on electrical installations/equipment, the circuits shall be de-energised and ascertained to be dead by positive test with an approved voltage testing device. Switches shall be tagged or the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects viz. LOTO system to be followed.
- That there shall be no danger from any adjacent live parts and
- That there shall be no chances of re-energisation of the equipments on which the persons are working. (Tag out and lock out LOTO system to be strictly followed).
- While working on or near a circuit, whenever possible the use of one hand may be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.

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- When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not “freeze” to the conductor.
- Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet. Rubber mats should be placed in front of Panels / Distribution Boards as per Indian Standards.
- Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.
- When two persons are working within reach of each other, they shall never work on different phases of the supply.
- When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment / circuit.
- It shall be ensured that the insulation and wire size of extension cords is adequate for the voltage and current to be carried.
- While tapping electricity from the socket, plug top must be used. It shall be ensured that no extension boards are over loaded while tapping. Only standard three pin plugs (Naked Wire is prohibited) shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with good ones. Only joint free cables shall be used for connecting equipment/Use of apparatus.
- Floors shall be kept free from trailing electrical cables to avoid tripping hazard.
- Power supply to all the machines and lighting fixture shall be switched off when not in use.
- Temporary electrical connections shall be removed as soon as the stipulated work is over. After completion of the works, the contractor shall dismantle the distribution boards and the other facilities he may have erected.



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- Unauthorised tapping of power by others from distribution boards under the control of the contractor shall be prohibited at all circumstances.
- No flammable materials shall be stored in any working area near the switchboards.
- Safety work permits shall be used for switching off the main feeder and equipment by the contractor.
- “MEN ON LINE” “DO NOT SWITCH ON” “DANGER” or “CAUTION” boards as applicable shall be used during maintenance works on the electrical equipment.

### 30. PORTABLE ELECTRICAL EQUIPMENT:

- Portable electrical tools must be examined, maintained and tested daily, fortnightly and quarterly so that the equipment and its leads are in good order. Register shall be maintained for inspection recording the testing dates and results of the equipments. Inspection checklists to be formed to that effect. The recertification of lifting tools, tackles, equipments etc. must be carried out well before the expiry of its validity period.
- All portable appliances shall be provided with three core cable and three pin plugs. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.
- All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wire in one length. No joints shall be allowed in this flexible wire. In case length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch, socket and ELCB of 30mA max.
- Flexible cables for portable lamps, tools and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.
- For excavations, one time clearance from electrical is required for a particular area.
- Contractor shall get their welding machine / Stress Relieving (SR) electrical equipment / all portable machine certified by MRPL / MRPL authorised contractor and seal will be fixed on





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machine to that effect. Certificate from third party mentioning the checks carried out, repairs carried out and safe to use to be submitted to Engineer Incharge.

Revalidation to be done once in 4 months. Incase contractor does not comply, it will be done by MRPL and four times the cost of repair will be back charged to contractor.

- Incase of welding, separate return cable from job piece to welding machine to be connected. Wires not to be used. PVC insulated cables only to be used.
- All lighting circuits/temporary connections for portable machine should have ELCB's of 30mA capacity max.
- All ELCBs to be tested once in 15 days using ELCB testers (and not by the lamp with open wires) and record maintained. Also separate register for ELCB trips (TRIP REGISTER) shall be maintained. It shall be daily signed by the site In charge of the contractor.
- Earthing of Neutral, which will act as return path, is not allowed.
- Electricians should have wireman license.
- During monsoons, monsoon protection for electrical equipment to be done.
- All feeders in contractor distribution panel to be clearly lettered with load details for isolation incase of emergency.
- Insulated tools like screwdriver, cutting plier, tester to be used.
- Each contractor should have one set of multimeter, ELCB tester and tong tester.
- First aid kit to be available.
- The contractor must have a team of Experienced Electricians (having minimum of 10 yrs. experience in carrying out safety inspection and testing of Electrical Equipments, tools, portable electrical machines and appliances etc.). to conduct periodical (Daily, fortnightly, monthly and quarterly) inspection and testing of Electrical Equipments, tools and portable electrical machines, tools and appliances and to maintain its records.
- All power cable ends should have industrial plug on one side and other end directly into the machine. (No naked end pinning into will be permitted).

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- For any job within MCC / SRR a work permit will be issued by MRPL operation. Job should not be started without these permits.

### **31. ROLE OF CONTRACTOR INCASE OF EMERGENCY AND SIREN:**



- Contractor shall instruct his workers to follow instructions strictly in case of fire siren / emergency or if advised or felt necessary by Engg. In-charge. If evacuation is ordered they must leave the work site and proceed towards the nearest designated assembly point. The contractor and its employees MUST follow specific instructions (Roles and Responsibilities incase of fire / onsite emergency) that will be given during training from time to time. All contractor employees MUST undergo such training, before their deployment at the work site. Contractor shall arrange & conduct such trainings for his employees and also employees of sub-contractors.
- Contractor shall instruct his workers to stop all jobs immediately incase release of liquid/gas/toxic/hazardous chemicals etc, and inform the concerned MRPL personnel available at site.

### **32. TRAINING:**

- The contractor to conduct Induction training of all employees and record maintained.
- The contractor will have to depute all his employees (including Engineers, supervisors and workmen), before they commence work for the first time at MRPL site and subsequently once in a year, to undergo Safety training. They will get photo gate passes only after the completion of the training. Contractors MUST have and get conversant with Material Safety Data Sheets of all the Chemicals in MRPL. It is a MUST for them to carry the photo passes with them and produce it when demanded at site.
- Tool box talks to be conducted every day before starting of each shift and before commencing of work after lunch break by the concerned Engineer.

### **33. LIST OF PERSONAL PROTECTIVE EQUIPMENTS:**

The contractor must poses the following minimum safety Items cum Personal Protective Equipments. All Personal Protective Equipments used at site to be of approved make.

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### **34. MANDATORY FOR THE CONTRACTOR EMPLOYEES WHILE WORKING INSIDE REFINERY:**

\* Deployment of adequate nos. of safety officers as per table above and making available the mandatory items as per the minimum list below is a MUST as a part of mobilization activity.

1. Safety Helmet.
2. Safety shoes (Conforming to IS standards with ankle protection, steel toe and anti-skid / acid, alkali and water proof soles).
3. Hand gloves (Leather impregnated cotton hand gloves).
4. Spectacle type goggles with toughened glass lenses, plain face shields with and without chin guards.

The contractor must use the “ISI” marked Personal Protective Equipments specific to the job.

It is mandatory to have minimum backup stock of all the PPEs in addition to what is already in use at site.

### **35. SPECIFICATIONS FOR SAFETY HELMETS-HDPE:**



1. Helmet Safety Industrial HDPE white colour.
  2. Contractor’s Logo at front side.
  3. Conforming to IS 2925, ISI marked & DGMS approved.
  4. Nape strap type adj. type 6 point adj. head band & sweat band with 3/4" Cotton Chinstrap.
- \* Green helmets for Safety Personnel and Red helmets for electricians to be provided and used by them.

### **36. SPECIFICATION FOR FULL BODY SAFETY HARNESS) SAFETY BELT**

Full Body Safety Harness (Safety belts) must be double lanyard type with scaffolding hook having self closing latch (spring type).

Different type of hooks to be available based on the nature of job / type of support.

Safety belts should be ISI marked and should conform to IS 3521 and DGMS approved and stamped.

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Safety belts, safety straps, lifelines, permanent anchors and connections should both separately and when assembled:

- a) Be capable of supporting safely a suspended load of at least 450 kg (1,000 lb) ; and
- b) Have a breaking strength of at least 1,150 kg (2,500 lb).

If hooks are used for attaching safety belts to fixed anchors, they should be self closing safety hooks of various types and sizes.

When a lifeline or safety strap is liable to be served, cut, abraded or burned, it should consist of a wire rope or a wire-cored fiber rope.

Safety straps should be so fastened to safety belts that they cannot pass through the belt fittings if either end comes loose from its anchorage.

Metal thimbles should be used for connecting ropes or straps to eyes, rings and snaps. Safety belts, safety straps and lifelines should be so fitted as to limit the free fall of the wearer to 1m (3ft 3in).

### **37. SPECIFICATION FOR FALL ARRESSTOR DEVICE:**

Fall arrestor device with self-retracting cable integrating locking mechanism combined with an energy absorption element fully automatic having cables of various lengths, ISI and DGMS and or any international approval. Only Poly Amide rope shall be used.

### **38. SPECIFICATION FOR DUST MASK:**



Dust Mask made of superior quality non-aging chemical-resistant rubber half face piece with reflex sealing flaps for protection against nuisance dust, (<0.5 micron) toxic dusts, gases and vapours with replaceable filters.

### **39. SPECIFICATION FOR REPLACEABLE FILTERS**

For protection against nuisance dust, toxic dusts, gases and vapours upto a concentration of 500 ppm. To be fitted on aforesaid Dust Mask

### **40. SPECIFICATION FOR SAFETY SHOES**

1. Safety Shoes, Jodhpury style- as per is 11226- 1985 with guarantee for 1& 1/2 years (all weather).
2. Acid/ alkali/ waterproof heat resistant, antiskid green PVC Nitrile sole.
3. Steel toe cap as per relevant "IS".
4. Upper plain leather, high ankle, with metallic 4 eyelets.

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5. ISI marked.
6. The supplier should give guarantee of use of safety shoes during rainy season.

#### **41. STANDARD SPECIFICATION FOR PVC HAND GLOVES**

Hand contoured for greater comfort & feature an embossed nonslip grip for handling wet or greasy objects cotton flock lining absorbs perspiration maximises easy on/off black with straight cuff each pair pack.

#### **42. SPECIFICATION FOR ELECTRICAL PPE (SHOCK PROOF)**

Hand gloves used for live electrical works shall be of proper electrical rating.

Electrical (shock proof) Safety Shoes (Jodhpury type) with acid/ alkali/ water proof, heat resistant, antiskid sole with guarantee for 1&1/2 years (all weather).

1. Upper plain leather.
2. ISI marked & latest certificate of testing from any of the govt. recognised institution for electrical resistance.

GUMBOOTS with steel toe should be used by personnel during rainy season.



The aforesaid guidelines are the minimum safety requirements and the contractor should exceed them so as to achieve “ZERO ACCIDENT” which is our MOTO.

#### **43. TYPE SAFETY VIOLATIONS AND PENALTY SYSTEM:**

All the contractors working for MRPL shall strictly follow the safety norms as per the rules and regulations of MRPL. Contractors who violate safety norms while executing the jobs will be penalized financially.



The details of penalty amount against each safety violations is enclosed as Annexure-B.

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### Annexure B

SL No	Type of Safety Violations	Amended/New penalty
1	No Lost Time Incident (NLTI) - Reporting back to duty within 48 hrs	First occasion Rs 2,500/- Second occasion Rs 5,000/- Third occasion Rs 10,000/- In addition to other expenses borne by contractor towards treatment. Existing Policy: none
2	Reportable Lost Time Incident (RLTI) - No reporting to duty within 48 hrs	First occasion Rs 10,000/-  Second occasion Rs 25,000/- Third occasion Rs 50,000/-  In Addition to other expenses borne by contractor towards treatment. Existing Policy: none
3	Disability	Rs 1,50,000/- per person Existing Policy: none
4	Fatal	Rs 5,00,000/- per person
5	Vehicle Accident - Vehicle damaging Property or Vehicle to Vehicle Accident.	Rs 25,000/- and Repairs/damage/restoration Existing Policy: none
6	For not using Personal Protective Equipment like (Safety Helmet, Safety Goggles, Safety Shoes, Hand gloves, Boiler suit, etc)	Rs 500/- Per day/ per item/ per person for first violation. Rs 1,000/- for second onwards.



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7.	Working without permit/ Clearance (Cold Work)	Rs 5,000/- per occasion After 3 violations, holiday listing for 6 months.
8	Hot work without proper permit/ Clearance	Rs 10,000/- per occasion. After 3 violations, holiday listing for 6 months
9	Non-use of safe electricity at work site (non installation of ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire/ cables on the roads, etc.	Rs 3,000/- per item
10	Working at heights without safety belt (Full Body Safety Harness), using non-standard scaffolding and not arranging fall protection arrangement as required	First occasion Rs 2,500/- Second occasion Rs 5,000/-
		Third occasion Rs 10,000/- After three occasions, holiday listing for 6 months
11	Unsafe handling of compressed gas cylinders (No trolley, jubilee clips, double gauge regulator, Improper storage/ handling).	Rs 500/- per occasion
12	Non fencing/ barricading of excavated areas	Rs 1,000/- per occasion
13	Use of domestic/ commercial LPG cylinder for cutting purpose	Rs 1,000/- per occasion.
14	Non-display of name board, permit, etc at site	Rs 500/- per occasion
15	Not providing shoring/ strutting/ proper slope and not keeping the excavated earth at least 1.5m away from the excavated area	Rs. 2,000/- per occasion
16	Wrong parking of vehicles or parking the vehicles at non-designated places inside refinery	Rs 1,000/- per occasion
17	Absence of contractor representative in refinery safety meetings whenever called	Rs 3,000/- per meeting



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18	Non-deployment of safety supervisor/ supervisor responsible for safety at work site required as per Special Safety Conditions	Rs 3,000/- per day
19	Failure to maintain safety register and records by contract Safety Supervisor or the Supervisor responsible for safety	Rs 1,000/- per day
20	Failure to have daily safety site inspection/ audits, monthly safety meetings and maintain records (by contractors themselves)	Rs. 1,000/- for each occasion
21	Failure to submit monthly safety report by the 5th of the next month to the Engineer-In- Charge	Rs. 1,000/- per occasion
22	Poor Housekeeping	Rs 1,000/- per site/ per day
23	Failure to follow injury reporting system	Rs 10,000/- per occasion
24	Violation of safety condition as per Job Safety Analysis (JSA)	Rs 10,000/- per occasion
25	Over-Speeding of vehicle i.e speed > 16 KMPH while driving inside refinery	The driver will be removed and gate pass will be withdrawn. Contract will be cancelled upon repeated three violations
26	Overtaking of vehicles while driving inside refinery	The driver will be removed and gate pass will be withdrawn Contract will be cancelled upon repeated three violations
27	Driving of vehicle without valid license	First occasion Rs 1,000/- Second occasion Rs 2,000/- The driver will be removed and gate pass will be withdrawn.
28	Driving vehicle without PESO approved or PESO approved but damaged spark arrester	The driver will be removed and gate pass will be withdrawn. Contract will be cancelled upon repeated three violations.

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29	Driving vehicle on “NO ENTRY ROADS”	The driver will be removed and gate pass will be withdrawn.  Contract will be cancelled upon repeated three violations.
30	Denying to produce the photo Gate Pass on demand	Rs 500/- per person per occasion
31	Contract worker found drunk/intoxicated state inside the refinery	Rs 15,000/- per person per occasion



### Standard Operating Procedure for Social Distancing at MRPL

Sl. No.	Procedure	Action plan
1	All areas in the premises including the following shall be disinfected completely using user friendly disinfectant mediums a. Entrance Gate of building, office etc. b. Canteens and pantries c. Meeting room, Conference halls / open areas available/ veranda/ entrance gate of site, bunkers, porta cabins, building etc. d. Equipment and lifts. e. Washroom, toilet, sink, water points etc. f. Walls/ all other surfaces	Disinfection of all the areas and Refinery Township on regular intervals is being strictly followed.
2.	For workers coming from outside, special transportation facility will be arranged without any dependency on the public transport system. These vehicles should be allowed to work only with 30-40% passenger capacity.	Being followed.
3	All vehicles and machinery entering the premise should be disinfected by spray mandatorily	All vehicles hired by MRPL are being disinfected at regular intervals.
4	Mandatory thermal scanning of everyone entering and exiting the work place to be done	Body temp monitoring all who are entering and exiting through all the gates in all the shifts being done.

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5	Medical insurance for the workers to be made mandatory.	Medical insurance is available for MRPL employees. Term insurance is available for contract workers apart from ESI.
6	Provision for hand wash & sanitizer preferably with touch free mechanism will be made at all entry and exit points and common areas. Sufficient quantities of all the items should be available	Hand wash and sanitisers are kept in all the places. Sufficient stock is available.
7	Work places shall have a gap of one hour between shifts and will stagger the lunch breaks of staff, to ensure social distancing	Shift/ General shift timings are staggered to ensure social distancing.
8	Large gatherings or meetings of 10 or more people to be discouraged. Seating at least 6 feet away from others on job sites and in gatherings, meetings and training sessions.	Awareness through circular and office orders. Necessary care is taken in seating to maintain distance
9	Not more than 2/4 persons (depending on size) will be allowed to travel in lifts or hoists.	Awareness through circular and intranet.
10	Use of staircase for climbing should be encouraged	Awareness through circular and intranet
11	There should be strict ban of gutka, tobacco etc, and spitting should be strictly prohibited.	Awareness through circular and intranet
12	There should be total ban on non-essential visitors at sites.	Awareness through circular and intranet
13	Hospitals/clinics in the nearby areas, which are authorised to treat COVID-19 patients, should be identified and list should be available at work place all the times.	List prepared and available in Hospital.



**NOTE:**

**“Bidders shall comply with the Covid guidelines issued by Government of India/ Government of Karnataka or other concerned authorities as applicable from time to time.”**


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[Annexure IX to SCC]

**Steel Price Variation**

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Circular issued by O/o Chief Engineer, CPWD, Delhi NCR for the month of October 2021 is attached  
[Annexure IX to SCC]

 भारत सरकार केन्द्रीय लोक निर्माण विभाग डीजी/10सी0ए0/62 महानिदेशक, फोर्लोनि0वि0 द्वारा प्रदत्त अधिकारों से जारी किया गया		दिनांक 22.11.2021			
निर्माण भवन, नई दिल्ली					
विषय: निविदा फार्म 7 और 8 में खंड 10 ग क 10(CA) के प्रचालन हेतु अक्टूबर - 2021 माह का सूचकांक व आधार दरें । SUB: Base prices and indices for operation of clause 10 CA in contract forms PWD 7 & 8 for the month of <b>October-2021</b>					
ज्ञापन <b>MEMORANDUM</b>					
Sl.No.	Material	Unit	Base Price for the month of		All India Price index (Base Oct.2012 = 100) for the month of October-2021 (B)/(A)*100 (C)
			Oct-2012	October-2021	
			(A)	(B)	
1	2	3	4	5	6
1	<b>Cement</b>				
	a) Cement (OPC)	MT	3978.00	4100	103.07
	b) Cement (PPC)	MT	3711.00	4094	110.32
2	<b>Reinforcement bars TMT Fe500 D -12 mm</b>				
	a) Primary Producers	MT	45133.00	54000	119.65
3	<b>Structural steel</b>	MT	41529.00	58715	141.38
4	<b>P.O.L (Diesel)</b>	Litre	46.95	91.77	195.46

  
 23/11/21



MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE

PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL  
REFINERY, MANGALORE, KARNATAKA  
VOLUME I : COMMERCIAL



NOTE:- 1. Base price & indices for Cement , TMT bars & Structural steel w.e.f. July 2017 onwards **are without GST** and for P.O.L (Diesel), it is with VAT.

2. These base prices are applicable for **Delhi, Faridabad, Gurgaon, Ghaziabad and NOIDA only.**

  
(इ. सी एस आनंद)  
कार्यपालक अभियन्ता (टास)



सं० 137 / अधी०अभि०(टास) / 10सी०ए० / 2021 / 370-हि०

Dated: 22 / 11 / 2021

प्रतिलिपि: 1 कें०लो०नि०वि० की वेबसाइट <http://cpwd.gov.in> द्वारा सभी विशेष महानिदेशक / अपर महानिदेशक / मुख्य अभियन्ता / अधी०अभि० / कार्य०अभि०, कें०लो०नि०वि० एवं लो०नि०वि० नई दिल्ली ।

  
कार्यपालक अभियन्ता (टास)



All India Wholesale Monthly Price Index for **MILD STEEL: LONG PRODUCTS** and for steel shall be **MILD STEEL: FLAT PRODUCTS** released by Office of Economic Advisor to Government of India, Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry corresponding to the period of the base price for the month for which the last price bid is submitted. (For example purpose, the website snapshot of the same for the month of Jan to Dec 2021)





 <p>ONGC एन.ओ.ए.पी.एल. MRPL</p>	<p><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <hr/> <p><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b></p>	 <p><b>nauvata</b> ENGINEERING CONSULTANTS</p>
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**[ANNEXURE X TO SPECIAL CONDITIONS OF CONTRACT]**

**Steel Price Index**



	<p align="center"><b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b></p> <p align="center"><b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA</b></p> <p align="center"><b>VOLUME I : COMMERCIAL</b></p>	
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भारत सरकार GOVERNMENT OF INDIA	वाणिज्य एवं उद्योग मंत्रालय MINISTRY OF COMMERCE & INDUSTRY	 हिंदी संस्करण										
	<p align="center">आर्थिक सलाहकार का कार्यालय <b>OFFICE OF THE ECONOMIC ADVISER</b> DEPARTMENT FOR PROMOTION OF INDUSTRY AND INTERNAL TRADE</p>	  <p align="center">एक कदम स्वच्छता से जोड़ें</p>										
<p><u>Wholesale Price Index (WPI)</u></p>												
<p>Monthly Wholesale Price Index Name of Commodity : d. Mild Steel -Long Products Type : Group Item Weight : 1.08063 Base Year : 2011-12 – 100</p>												
Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	125.6	124.7	124.6	127.6	100.9	131.7	131.4	132.9	133.5	140.6	140	139.1
<p>1. Figure 0 may be treated as index for particular item not-available. 2. Figures for the latest two months are provisional. Latest two months are to be reckoned with reference to the latest monthly press release issued. 3. (NR : Not Released) : Please refer official Press Release for more information.</p>												
<p align="center">Website Content Managed by Office of the Economic Adviser, DPIT, MoCI, GoI</p>												
<p align="right">Disclaimer   Last updated on 14.01.2022</p>												



## MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE

### PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL



भारत सरकार  
GOVERNMENT OF INDIA

वाणिज्य एवं उद्योग मंत्रालय  
MINISTRY OF COMMERCE & INDUSTRY



हिंदी संस्करण



आर्थिक सलाहकार का कार्यालय  
**OFFICE OF THE ECONOMIC  
ADVISER**

DEPARTMENT FOR PROMOTION OF INDUSTRY AND  
INTERNAL TRADE



### Wholesale Price Index (WPI)

#### Monthly Wholesale Price Index

Name of Commodity : e. Mild Steel - Flat products

Type : Group Item

Weight : 1.14442



Base Year : 2011-12 = 100

Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	136.8	134.4	133.5	142.3	152.4	154.9	156.3	156.4	156.3	159.7	163.4	160.6

- Figure 0 may be treated as index for particular item not-available.
- Figures for the latest two months are provisional. Latest two months are to be reckoned with reference to the latest monthly press release issued.
- (NR : Not Released) : Please refer official Press Release for more information.



Website Content: Managed by Office of the Economic Adviser, DPPII, MoCI, GoI


Disclaimer | Last updated on  
14.01.2022

 The logo for ONGC (Oil and Natural Gas Corporation) is shown in green, featuring a stylized oil derrick. Below it, the logo for MRPL (Mangalore Refinery and Petrochemicals Limited) is also in green, featuring a stylized oil derrick. The text 'ONGC' and 'MRPL' is written in English and Hindi.	<p>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</p> <p>CIVIL &amp; STRUCTURAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</p>	 The logo for nauvata Engineering & Technology is shown in blue, featuring a large stylized letter 'N' above the word 'nauvata' in a lowercase sans-serif font. Below 'nauvata' is the text 'ENGINEERING & TECHNOLOGY' in a smaller font.
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[ANNEXURE - XI TO SPC]




Procedure for Final Documentation (SPC-000009) (Rev-01)

	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE	
	CIVIL & STRUCTURAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL	



	MANGALORE REFINERY AND PETROCHEMICALS LIMITED	
	PROCEDURE FOR FINAL DOCUMENTATION	SPC00009 Rev.1




**SPC-000009**

1	01/12/2020	Revised and Reissued	 1/12/2020		
0	01/09/2015	Revised, Renumbered and Reissued	HP	AC	HSR
Rev No	Rev Date	Description	Prepared By	Checked By	Approved By

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Doc. No.	Rev	SAP/DMS/DIR	PAGE

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>CIVIL &amp; STRUCTURAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

	<b>MANGALORE REFINERY AND PETROCHEMICALS LIMITED</b>	
	<b>PROCEDURE FOR FINAL DOCUMENTATION</b>	<b>SPC00009 Rev.1</b>

## 1. OBJECTIVE

- 1.1 This procedure provides general guidelines to compile and submit the Final Documents to MRPL by the agency is executing specific job against a W.O. or a P.O. issued by MRPL or by any agency on behalf of MRPL
- 1.2 Final Document as per these guidelines shall be prepared *in addition* to the documents issued during project execution (construction documents), which is normally released in parts while the job is in progress.
- 1.3 This is a general guideline for all projects of MRPL, however any addition or deletion of the clauses based on the specific project requirement shall be approved by PMC or the Engineer-in-charge of MRPL. An approved deviation note shall be furnished for this purpose.

## 2. COMPONENTS OF THE FINAL DOCUMENTS

### 2.1 BASIC DESIGN & EXTENDED BASIC DESIGN PACKAGES

Basic and extended design packages shall be compiled and the revision control shall be maintained by the respective PMC or the similar agency of the project. At the completion of the project complete and updated sets of design packages with all latest revisions shall be handed over to MRPL. Similarly Basic Engineering Design Basis for unit & facilities shall be handed over to MRPL.

### 2.2 MASTER INDEX FOR DOCUMENTS & DRAWINGS

- 2.2.1 These shall be treated as a key document for reviewing completeness of the documentation at any point of time. It shall show details of documents/ drawing applicable for any equipment / system / service. Master Drawing/Document Index shall have following columns :-



Unit	Job/PO No	Folder No.	Sr. No.	Drw./Doc. No.	Rev.	No of Sheets		Equip. No	Drawing /Doc Title	Remarks
						From	To			


Rev	Date	Prepared by	Checked by	Approved by PMC/Consultant	Approved by MRPL

- 2.2.2 A detailed list of PO/Contract to be furnished to MRPL Engineering Documentation Centre to ensure that documentation of equipment / contract is/are submitted in totality.

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	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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	<b>MANGALORE REFINERY AND PETROCHEMICALS LIMITED</b>	
	<b>PROCEDURE FOR FINAL DOCUMENTATION</b>	<b>SPC00009 Rev.1</b>

2.2.3 A complete list of drawings and documents including document control index to be submitted in addition to clause 2.2.1.

### 2.3 SECTIONS OF THE FINAL VENDOR/ENGINEERING DOCUMENT FOLDER

#### 2.3.1 Section A : Contents

Shall have following columns:-

Sr. No.	Drawing No.	Rev.	No of Sheet	Equipment	Drawing Title	Digital file name (SOFTCOPY)



This content to be certified by the PMC/Consultant/Engineer-in-charge of MRPL for its completeness in all respects.


#### 2.3.2 Section B : Technical Documents/Drawings

Followings are the various subsections

Sr no.	Documents
<b>Vendor requirement</b>	
1	Detailed technical with PR / Engineering Specification / Design Basis / Design Calculation/Sizing calculation
2	Equipment list.
3	As-Built Specification sheet / data sheet, Performance Curve
4	General arrangement drawing, Cross Sectional drawing, Part Drawing
5	Assembly drawing, Fabrication, structural & foundation drawing
6	Foundation Information Document for Foundation Design
7	Drawings / catalogues, for special items like spring/hangers/ expansion bellows etc
8	Instrument/Electrical system all documents
9	Details documents & drawings, Data sheet, Manual & Catalogues of Bought-out Component,
10	Guarentee certificate, Inspection release note in original
<b>Engineering requirement</b>	
11	Flow Sheet & summaries (System Drawing, P&IDS, Utility Flow Dia., Material flow diagram), Utility and Chemical Consumption Data
12	Layout Drawing, Piping, Civil, Structural general arrangement Drawing
13	Instrument/Electrical specifications, data sheets & drawings
14	Line schedule, Stress analysis documents.

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15	Under ground piping, OWS & CRWS drawings along with standard & specification.
16	Piping material specification, Valve material specification
17	Pipe Support drawings / Standards, Lubricants List
18	Line wise bill of materials and summary
19	Process and mechanical Design / Strength calculations, Hazop report, Stress analysis report.
20	Any other documents like Fire fighting system, soil investigation, survey documents, Statutory documents etc.

### 2.3.3 Section C : Manual / Procedures

Sr no.	Documents
1	Fabrication Procedure / Sequence
2	Inspection and Test Procedure, Quality acceptance procedure, Job procedure & Procedures for Erection and Commissioning
3	Installation, Operation and maintenance Manual
4	Storage & Handling procedure, Protection and Preservation Procedures

### 2.3.4 Section D : Inspection and Test Records including IBR certificates & all reports.

### 2.3.5 Section E : Spare Parts and Tool List

### 2.3.6 Section F : As built drawings

In this section asbuilt drawings for all site fabricated items, engineering drawings like process, piping, civil, electrical, instrumentation, plot plan, fire fighting, line schedules, pipe supports index/register, piping isometrics, fire fighting etc. shall be compiled in an orderly manner.



- The file format shall be labeled as mentioned in section 3
- All as built drawings (Hard copy) shall be approved by authorised signatory/ Inspection agency with seal & sign  
Items mentioned from 2.3.2 to 2.3.6 are indicative only, any deviation from this shall be approved by concern EIC of MRPL.


### 2.3.7 Section G : Digital Copy

- Two sets of digital copies shall be submitted in CD/DVD with proper lable. If size of the total files of a PO/Equipment is crossing more than 10GB same to be submitted in external hard disk. Master index for all the files and file index for individual file must be available in searchable pdf/ Excel format.

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2. All drawings shall be on the latest version of AutoCAD. If drawing is prepared in other format same need to be converted in to the latest AutoCAD version..
3. Engineering documents/drawings/design calculation/design specification prepared using any software shall be submitted in native format and same output is also to be provided in searchable pdf version.  
  
Operating manuals and others documents shall be on MS Word / Excel or on searchable pdf format. Soft copies should be segregated index wise as per clause no. 2.3.1 contents of the document folder. Total document folders must not be scanned in a single file.
4. Hand written/filled test reports to be submitted in pdf format.
5. Radiography films preferably to be submitted in digital format.



#### 2.4 FIELD INSPECTION DOCUMENTATION


- 2.4.1 A detailed index to the content shall be available at the beginning of each file
- 2.4.2 Each inspection reports shall be indexed with the report number and number of pages
- 2.4.3 All Documents/Reports shall be approved in its totality by stamping & signing the Master Indexes as per section 2.2.1.
- 2.4.4 Radiography films shall be indexed and included with the final documentation package.
- 2.4.5 All radiographic films shall be put in an aluminum box/container with lock and key.
- 2.4.6 As built drawings if any shall be compiled as per section 2.3.6
- 2.4.7 Digital Copy : as per clause no. 2.3.7

#### 3. FILE FORMAT OF DOCUMENTATION FOLDER

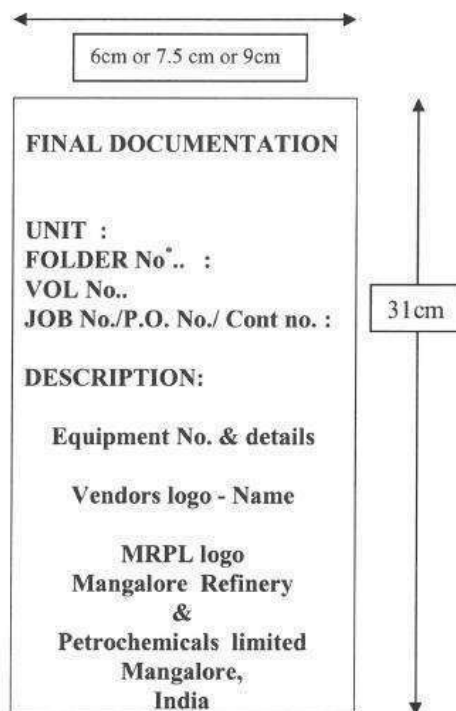
- 3.1 **Filing** : As far as possible separate folder has to be prepared for each equipment / system / service, however if documentation for a particular equipment / system /service are required to be filed in more than one files due to the volume, identical folder no. suffixing numbers of files e.g. 1/5, 5/5 etc shall be mentioned. On the other hand if the volume of documentation is less one folder may be used for more than one equipment of the same group, e.g. two or more pumps may be filed in one file, but not pumps, compressors, exchanger etc in one single file.

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- 3.2 **Drawing Filing** : Each single drawing shall be put in separate transparent A/4 size drawing (non sticky) pouch and shall not be punched.
- 3.3 **File size** : All documents and drawings shall be compiled in A4 size file(s) ( 28cm x 31cm), with 2-clips. Width of the file can be, 6.0 cm or 7.5 cm or 9.0 cm. based on the volume of documents
- 3.4 **Document size** : The documents / drawings submitted in file shall be in its original size (A0/A1/A2/A3/A4), and to be folded in A4 size to accommodate in the A4 size drawing pouch as mentioned in 3.2.
- 3.5 **Digital Copies** : Each single CD/DVD shall have proper lables and to be filed in a separate distinct section of the document folder.
- File label : Each file shall display following information on its spine.



\* To be provided in consultation with PMC / MRPL Engineering Documentation Centre.

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#### 4. SUBMISSION OF DOCUMENTS

4.1 All final documents duly compiled by this procedure alongwith deviation note as mentioned in section 1.3 shall be handed over to MRPL Engineering Documentation Centre through PMC / consultant / Engineer-in-charge of the project.

4.2 Completion Certificate from PMC/Consultant/Engineer-in charge, as per following format shall be attached in all document folder

-----  
**COMPLETION CERTIFICATE OF FINAL DOCUMENTATION**

Name of Supplier/ Contractor :  
 Customer :  
 Project :  
 Project No. :  
 Purchase Order No./ Contract No. :  
 Purchase Requisition No./ Tender No. : Rev.No. :  
 Name of the work/Equipment :  
 MRPL Equipment Tag. No. :  
 Supplier's / Contractor's Works Order No. :  
 Total No. of files :

Certified that the Engineering Documents / Manufacturing & Test Certificates submitted by the supplier are duly checked by us and found complete in all respect in accordance with the final documentation procedure No. SPC-000009 Rev 01.

Signature : .....	Signature : .....
Date : .....	Date : .....
Name : .....	Name : .....
Designation : .....	Designation : .....
Department : .....	Department : .....

Supplier /Contractor

PMC/Overall contractor

4.3 Piecemeal submission shall be avoided.

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- 4.4 If any document /drawing is required to be submitted in later date after submission of final folder, shall clearly appear in the content (section 2.3.1) with a note "LATER" duly approved by PMC / Consultant / Engineer-in charge
- 4.5 Work related Piping and Civil area drawings to be updated "Asbuilt" by PMC/Contractor with their respective changes at site.
- 4.6 Number of sets of Final Documents

Sr.No.	Document Group	# Copies	Digital File
1	Basic /Extended Design Packages	1	2
2	Vendor / Engineering Documentation / Drawings (As-Built Final)	1(original)	2
3	Final Field Inspection Reports, Documents & Drawings (Drawings As-Built certified)	1(original)	2
4	Radiography films	1	2

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	<b>MRPL Marketing Terminal Project at Devangonhi, Bangalore</b> <b>Marketing Infrastructure Projects, MRPL</b>			
	APPROVED VENDOR LIST			Tender No : 3200000591
				Document No: -
				Rev : 0

### GENERAL NOTES/ INSTRUCTIONS

1.	ONLY 'FIRST' QUALITY MATERIALS SHALL BE USED.
2.	CONTRACTOR MAY PROCURE MATERIAL FROM ANY OF THE LISTED VENDORS. HOWEVER, WORKLOAD, STABILITY AND SOLVENCY NEED TO BE VERIFIED BY THE CONTRACTOR BEFORE PLACEMENT OF ORDER.
3.	PMC/OWNER RESERVE THE RIGHT TO CHOOSE ANY OF THE APPROVED PRODUCT/ BRAND/ MANUFACTURER AS PER THIS LIST.
4.	SPECIFICATION OF THE PRODUCT SHALL BE CHECKED AGAINST TENDER SPECIFICATIONS BEFORE SELECTING ANY PRODUCT/ BRAND. IN CASE OF ANY DISCREPANCY, TENDER ITEM/ SPECIFICATIONS SHALL PREVAIL, AND ANY SUCH PRODUCT/ BRAND SHALL NOT BE USED WHICH IS NOT CONFORMING TO TENDER SPECIFICATIONS EVEN IF IT IS APPEARING IN THIS LIST.
5.	DOSAGE OF ADMIXTURES, WHEREVER NOT MENTIONED IN THIS LIST, SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
6.	IN CASE OF NON-AVAILABILITY OF ANY PRODUCT AMONG APPROVED PRODUCTS/ BRANDS AT A PARTICULAR SITE/ REGION, ALTERNATE PRODUCT/ BRAND NAME SHALL BE PROPOSED BY CONTRACTOR TO PMC/OWNER FOR APPROVAL, ALONG WITH THE DETAILS OF THE PROPOSED PRODUCT/ BRAND FOR APPROVAL.
7.	CONTRACTOR SHALL NECESSARILY PROCURE ALL THE MATERIAL / EQUIPMENT FORMING PERMANENT PART OF THE UNIT / PLANT FROM OWNER / PMC APPROVED VENDORS ONLY. THIS SHALL INCLUDE SUB-ORDERED ITEMS / COMPONENTS ALSO. THE "APPROVED VENDORS" SHALL BE ITEM SPECIFIC.
8.	IN AN EVENTUALITY THAT CONTRACTOR ENCOUNTERS THE STATE OF NO RESPONSE FROM THE VENDORS ENLISTED IN THE BIDDING DOCUMENTS, UPON WRITTEN DOCUMENTARY EVIDENCE OF THE REGRET FROM THE ITB ENLISTED VENDORS, CONTRACTOR MAY CONSIDER, ALTERNATE VENDORS, WITH PRIOR APPROVAL OF OWNER/PMC. REQUISITE DOCUMENTATION SUPPLEMENTING THE CREDENTIALS OF THE PROPOSED ADDITIONAL VENDORS IN SUCH AN EVENTUALITY SHALL BE PROVIDED TO OWNER/PMC FOR APPROVAL. CONTRACTOR TO NOTE THAT IT SHALL BE THE CONTRACTOR'S EXCLUSIVE RESPONSIBILITY TO MEET THE QUALITY, SCHEDULE CONSIDERATIONS FROM THE PROPOSED ALTERNATE VENDOR. OWNER/PMC SHALL, IN NO WAY, BE RESPONSIBLE FOR DELAYS ON THIS ACCOUNT.
9.	COMPLIANCE TO PROCUREMENT OF MATERIAL FROM APPROVED VENDORS IS MANDATORY AND SHALL BE FULLY COMPLIED WITH. NO DEVIATION TO APPROVED VENDOR LIST SHALL GENERALLY BE ACCEPTABLE.
10.	FOR ITEMS NOT COVERED IN THE APPROVED VENDOR LIST, THE CONTRACTOR SHALL SUGGEST THE VENDOR FOR WHICH PRIOR APPROVAL TO BE TAKEN FROM OWNER/PMC.  THE VENDORS LIST SHALL BE APPROVED BY OWNER / PMC PRIOR TO PLACEMENT OF ORDER BY CONTRACTOR. CONTRACTOR SHALL LIST DOWN THE PROPOSED SUPPLIERS / VENDORS FOR SUCH ITEMS AND SUBMIT THE SAME FOR OWNER / PMC'S REVIEW / APPROVAL ALONG WITH NECESSARY DOCUMENTS / CREDENTIALS. NON-ACCEPTANCE OF A PARTICULAR PROPOSED VENDOR DUE TO ANY REASONS WHATSOEVER SHALL NOT BE A CAUSE OF SCHEDULE AND COST IMPLICATION.
11.	CONTRACTOR SHALL MAKE AN INDEPENDENT ASSESSMENT OF CAPABILITY OF ALL THE VENDORS FOR TIMELY DELIVERIES OF MATERIAL / EQUIPMENT. ANY DELAYS IN DELIVERIES BY VENDOR(S), SHALL NOT BE ENTERTAINED AS A CAUSE OF SCHEDULE AND COST IMPLICATION.
12.	AT ANY STAGE OF THE PROJECT, IF IT COMES TO THE NOTICE OF OWNER / PMC THAT CONTRACTOR HAS PROCURED MATERIAL / EQUIPMENT, INTENTIONALLY OR UNINTENTIONALLY WHATSOEVER, FROM AN UNAPPROVED VENDOR AND/OR ITEMS NOT FALLING IN APPROVED RANGE OF VENDOR(S), THE SAME SHALL BE REJECTED FORTHWITH AND CONTRACTOR SHALL BE LIABLE TO REPLACE SUCH MATERIAL / PLANT / MACHINERY WITHOUT ANY SCHEDULE AND COST IMPLICATION TO THE OWNER.

	<b>MRPL Marketing Terminal Project at Devangonthi, Bangalore</b> <b>Marketing Infrastructure Projects, MRPL</b>			
	APPROVED VENDOR LIST		Tender No : 3200000591	
			Document No: -	
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13.	LIST OF VENDORS APPEARING ANYWHERE ELSE IN THE CONTRACT DOCUMENT IN CASE OF DUPLICATION OF THE ITEMS AT TWO OR MORE PLACES (EXCEPT FOR THE VENDORS LIST PROVIDED BY PROCESS LICENSOR, IF APPLICABLE) SHALL NOT BE CONSIDERED BY CONTRACTOR AND SHALL BE SUPERCEDED BY THE VENDOR LIST ENCLOSED HEREWITH.
14.	IT IS UNDERSTOOD THAT SHOULD THE NAME OF VENDOR BE CHANGED DUE TO CHANGE IN THEIR COMPANY OR CORPORATE SHARE HOLDING, OWNER WILL ACCEPT SUCH VENDORS UNDER ITS NEW NAME WITH PRIOR APPROVAL AND SUBMISSION OF THE REQUISITE DOCUMENTATION BY THE CONTRACTOR. ANY SUCH APPROVAL SHALL HOWEVER, NOT RELEASE THE CONTRACTOR FROM ANY OF HIS OBLIGATIONS UNDER THE CONTRACT; NEITHER SHALL ANY SUCH APPROVAL SIGNIFY NOMINATIONS OR INSTRUCTION TO USE SUCH A VENDOR. ALL APPROVED VENDORS ARE DEEMED TO HAVE BEEN FREELY CHOSEN BY THE CONTRACTOR AT HIS OWN RISK.
15.	VENDORS ON OWNER / PMC HOLIDAY LIST SHALL NOT BE CONSIDERED FOR ORDERING. CONTRACTOR TO NOTE THAT DURING THE IMPLEMENTATION STAGES SHOULD A VENDOR LISTED IN THE VENDOR LIST BE PUT ON HOLIDAY THE OWNER/PMC RESERVES THE RIGHT TO INFORM CONTRACTOR TO ENSURE THAT NO SUBSEQUENT ORDERS, FROM THE TIME OF ISSUANCE OF THE MESSAGE FROM PMC, SHALL BE PLACED ON SUCH VENDORS. HOWEVER IT SHALL REMAIN AN EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE VENDOR, TO WHOM THE ENQUIRIES ARE BEING ISSUED/ORDER IS BEING PLACED BY THE CONTRACTOR, IS NOT ON OWNER/PMC HOLIDAY LIST. THIS REQUIREMENT HAS TO BE FOLLOWED BY THE CONTRACTOR WITHOUT ANY TIME AND COST IMPLICATION TO THE OWNER.



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### INSTRUMENTATION & TERMINAL AUTOMATION SYSTEM



SL. NO	INSTRUMENTS	APPROVED MAKES/BRANDS/VENDORS
1	BATCH CONTROLLER	DANIEL (EMERSON PROCESS CONTROLS)/ SMITH (FMC TECHNOLOGIES)/ HONEYWELL -ENRAF/ GE (AST)/ BOPP &REUTHER
2	PD METER WITH PULSE TRANSMITTER	LIQUID CONTROLS / IDEX/ BRODIE/SMITH (FMC TECHNOLOGY)
3	STRAINER & AIR ELIMINATOR (SIZED & INTEGRATED WITH PD METER & DCV)	LIQUID CONTROLS/ SMITH/ FLASH POINT / TOSHNIWALCRYOGENIC/ BROOKS/ TELTECH/ STEEL STRONG/BRODIE
4	PNEUMATIC CONTROL VALVE / SHUTDOWN VALVE(GLOBE TYPE)	FISHER-SANMAR/ INSTRUMENTATION LTD/ DRESSER INDUSTRIES (MASONIELAN)/ SAMSON CONTROLS (GLOBE TYPE)/ FORBES MARSHALL (ARCA)/ MIL CONTROLS/ FLOWSERVE.METSO/ CCI VALVE TECHNOLOGY GMBH
5	DIGITAL CONTROL VALVE	LIQUID CONTROLS / IDEX/ BRODIE
6	NEEDLE LOCK WITH MAGNETIC DEVICE	TOTAL LOCKOUT(SAFETY) LTD.
7	PNEUMATIC CONTROL VALVE / SHUTDOWN VALVE(BALL TYPE)	1. KITZ CORPORATION OF EUROPE SA 2. MOTOYAMA ENGINEERING WORKS 3. EMERSON 4. FLOWSERVE PTE LTD 5. KITAMURA VALVE MANUFACTURING CO LTD 6. METSO AUTOMATION 7. PENTAIR VALVES & CONTROLS INDIA PVT LTD 8. TYCO SANMAR LIMITED 9. ARGUS 10. MOGAS 11. FISCHER 12. KTM 13. WEIR VALVES
8	PNEUMATIC ON OFF BUTTERFLY VALVE / TRIPPLE OFFSET BUTTERFLY VALVE	1. MOTOYAMA ENGINEERING WORKS 2. EMERSON 3. FISHER 4. FLOWSERVE 5. INSTRUMENTATION LIMITED 6. METSO 7. PENTAIR VALVES & CONTROLS INDIA PVT LTD 8. SAMSON CONTROLS PVT LTD 9. MASONIELAN 10. VANESSA
9	ACTUATORS (PNEUMATIC) FOR SHUTDOWN SERVICES	1. BIFI 2. EMERSON (FISHER-ROSEMOUNT) 3. ROTORK 4. METSO
10	SELF ACTUATED PCV	1. DRESSER VALVE INDIA PVT LTD 2. ELSTER-INSTRUMET NV 3. EMERSON (FISHER-ROSEMOUNT) 4. NIRMAL INDUSTRIAL CONTROLS PVT LTD 5. JORDON VALVE
11	RADAR LEVEL GAUGE WITH TANK SIDE INDICATOR	EMERSON / ENRAAF/ E&H





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12	AVERAGING TEMP SENSORFOR TANKS	EMERSON / ENRAAF/E&H		
13	WATER INTERFACE MEASUREMENT SENSOR	EMERSON / ENRAAF/ E&H		
14	SIL VERIFICATION /VALIDATION/CERTIFICATION AGENCIES	TUV/HIMA/CHOLA MANDALAM / EXIDA		
15	PRESSURE GAUGE/DIFFERENTIAL PRESSURE GAUGE	WIKA/ MANOMETER INDIA/ A.N. INSTRUMENTS/ PRECISIONINDUSTRIES/ GENERAL INSTRUMENTS/ WAAREE INSTRUMENTS/ FORBES MARSHALL/ INDUSTRIAL INSTRUMENTATION/ H.GURU / PRICOL/ GE GAUGES		
16	SOLENOID VALVE	ASCO, NORGREN, HERION		
17	UPS	EMERSON-VERTIV/ APC/SCHNEIDER /GUTOR/ CHLORIDE/HITACHI-HIREL		
18	BATTERIES	AMCO-SAFT/ HBL-NIFE/AMARAJA/EXIDE		
19	LOADING ARM (TOP)	HEATLY AND GRESHAM/ TECHNICA/ ASSOCIATE ENGINEERS/WOOD FIELD/ LIQUIP/ OPW/EMCO WHEATON		
20	LOADING ARM (BOTTOM)FOR PRODUCT & VAPOUR	LIQUIP/ OPW/ EMCO WHEATON		
21	API COUPLER / DRY BREAKCOUPLERS	LIQUIP/ OPW/ EMCO WHEATON		
22	EARTHING RELAY	SCULLY/ ANDERSON/ DANIEL/ OSNA/ HONEYWELL-ENRAF/ AST/ OPW		
23	RACK MONITOR	LIQUIP/FRANKLIN FUEL/OPW/SCULLY		
24	TT MOUNTED OVERSPILL SENSOR/PROBE	LIQUIP/SCULLY/DIXON		
25	BOTTOM LOADING ARM POSITION SWITCH: PROXIMITY SWITCH/LIMIT SWITCH	MTL/PEPPERL+FUCHS/ TURCK /EMERSON /GE		
26	PROVER TANK	FMC TECHNOLOGIES/IDEX/FLASH POINT/CRYOGENICS		
27	PROVER PUMP/MOTOR	KIRLOAKAR/KSB/SULZER/FLOWSERV/BHARAT BIJLEE		
28	PROVER FLP STARTER/FLP POWER SCOKET	BALIGA/FEPL/EX-PROTECTA/FLEXPRO		
29	PROXIMITY CARD READER	WESTING HOUSE / DANIEL/ STAHL/ HONEYWELL-ENRAF/FMC TECHNOLOGIES/DANIEL(EMERSON)/AST		
30	REMOTE INTERACTIONTERMINAL (RIT)/DRIVER ACK	BALIGA. TELTECH/ FCG/ FEPL/ SUDHIR SWICTHGEAR PVT.LTD/EX-PROTECTA/FLEXPRO/SHYAM SWITCHGEAR		
31	DENSITY METER	SMITH/ MICROMOTION / EMERSON/ BOPP & REUTHER/ E&H/HEINRICHS MESSTEC UNIK/GMBH/LEMIS BALTIC		
32	RTD/ THERMOWELLS	GENERAL INSTRUMENTS/ NAGMAN/ ALTOP/ PYROELECTRIC/TEMPSEN INSTRUMENTS/ ABB AUTOMATION /EMERSON / WIKA / GAUGE BOURDON / GOA INSTRUMENTS/		
33	JUNCTION BOX & CABLEGLAND	BALIGA/ CEAG FLAMEPROOF CONTROL GEARS/ EX PROTECTA/FLAME PROOF EQUIPMENT (P) LTD/ FLEXPRO ELECTRICALS (P)LTD/ STERLING SWITCH GEARS CONTROLS (P) LTD/ SUDHIR SWITCH GEARS (P) LTD/ FLAMEPACK/ HENSEL ELECTRIC INDIAPVT. LTD./ KMG A TO Z SYSTEMS PVT. LTD. NEW DELHI/ COOPER CROUSE HINDS / FCG / STAHL /		
34	SIGNAL CABLE	DELTON CABLES LTD./ FINOLEX/ CORDS CABLE/ BROOKS CABLE/ PARAMOUNT CABLES/ THERMOPAD/ LAPP INDIA PVT.LIMITED. INDUSTRIAL CABLE LTD CHANDIGARH/ UNIVERSAL CABLE LTD/ KEI INDUSTRIES LTD. SPECIAL CABLES PVT LTD/ ELKAY TELELINK/THERMOCABLES LTD/SUYOG ELECTRICALS LTD/GOYOLENE FRIBRES/ FINE CORE CABLES LTD/NICCO CORPORATION LTD/BELDEN		

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35	CONTROL CABLE	PARAMOUNT COMMUNICATIONS LTD./ UDEY PYROCABLES PVT. LTD. LAPP/ DELTON/ UNIVERSAL CABLE/ RPG/ RELIANCE/ CMI/ KEI INDUSTRIES/ RADIANT CABLES/ HAVELL/ ELKAY TELELINKS LTD/ THERMOCABLES LTD/ SUYOG ELECTRICALS LTD/ GOYOLENE FRIBRES/ FINE CORE CABLES LTD/ NICCO CORPORATION LTD/ KEC INTERNATIONAL/ POLYCAB/ TORRENT/ RR KABLE/ CHORDS/ GEMSCABLE/ CCI/ BELDEN			
36	POWER CABLE	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/ TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ RR KABLE/ CHORDS/ GEMSCABLE/ CCI/ LAPP/ BELDEN			
37	SIL 3 PLC	HIMA/ YOKOGAWA/ EMERSON/ HONEYWELL/ ABB/ TRICONEX			
38	SIL CERTIFIED RELAYS	PHOENIX/ GM/ P&F			
39	DCS	YOKOGAWA/ EMERSON/ HONEYWELL/ INVENSYS (SCHNEIDER)/ ABB			
40	BARRIER GATE	HEIDZ INDIA/ TECHNICA/ METACHEM/ TECHNICA/ BOOM EDAM			
41	GUIDED WAVE RADAR	EMERSON (ROSEMOUNT)/ HONEYWELL (ENRAF) E&H/ VEGA/ MAGNETROL			
42	COMPUTER CONSOLES	PYROTECH CONTROL INDIA/ RITTAL/ HOFFMANN/SCHNEIDER or Equivalent			
43	PANELS & ACCESSORIES	PYROTECH CONTROL INDIA/ RITTAL/ HOFFMANN/SCHNEIDER			
44	COMPUTER	HP/ DELL / IBM			
45	MONITORS	HP/ DELL / IBM			
46	SERVER	DELL/ HP/ IBM			
47	REDUNDANCY SOFTWARE	STRATUS/ NEC/ SYMANTEC/ VMware			
48	DOT MATRIX PRINTER	WIPRO/ TVSE/ EPSON/ PANASONIC			
49	LASER PRINTER	XEROX/ HP/ EPSON/ CANNON/ DELL			
50	PRESSURE TRANSMITTERS	ROSEMOUNT/ ABB/ YOKOGAWA/ HONEYWELL/ FUJI			
51	PROXIMITY SWITCHES/LOADING ARM POSITION SENSOR	P & F/ TURCK / DANIEL			
52	BARRIERS	P & F/ MTL/ STAHL			
53	SURGE SUPPRESSION DEVICES	OBO BETARMANN/ MTL			
54	THERMAL RELIEF VALVE	KEYSTONE SEBIM INDIA FAINGER LESER TYCO SANMAR			
55	CHECK VALVES/NON RETURN VALVE	STEEL STRONG/ NITON/ PEC/ NECO SCHUBERT & SALZER PVT. LTD./ BDK ENGG./ AUDCO INDIA LTD./ ECONO VALVES PVT. LTD./ FOURESS ENGINEERING (I) LTD./ STEAM & MINING IND./ KSB PUMPS LTD./ BHEL LTD./ FISHER/ DENCIL/ L&T			
56	BALL VALVES(MANUAL)	AUDCO/ VIRGO/ FLOW CHEM/ KSB/ BDR/ METSO/ KITAMURA/ ORBIT/ MICROFINISH/ FISHER/ SAMSON/ ALPHA LEVEL SANNDERS LTD./ STEEL STRONG VALVES (I) PVT. LTD/ L&T			
57	PIPES	JINDAL PIPES/ TATA STEEL/ SAIL/ RATNAMANI/ INDIAN SEAMLESS/ MAHARASHTRA SEAMLESS/ BHEL/ SAW PIPES			
58	PIPES FITTINGS & FLANGES	GUJARAT INFRA PIPES/ TUBE PRODUCTS/ KWALITY/ VENUS/ PARVEEN IND./ STEWARTS & LLOYDS/ ADITYA FORGE LTD./ ALLIANCE FITTINGS & FORGINGS LTD. / SHIVANANDA PIPE FITTINGS LTD. CHENNAI./ NL HAZRA & SONS/ TEEKAY TUBES PVT. LTD			
59	FIBER OPTIC CABLE	AMP/ KRONE/ LUCENTAT&T/ FINOLEX/ DLINK/ HCLCOMNET (COMMSCOPE)/ SIMON/ TYCO/ ADS-KRONE/ HIMACHAL FUTIRISTIC COMMUNICATIONS/ BIRLA ERICSSON/ KABEL RHEYDT/ UNIFLEX CABLES/ BELDEN			

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60	ETHERNET SWITCHES	N-TRON/ CISCO/ FOUNDRY/ NORTEL/ MOXA/ HIRSCHMANN/ NETGEAR/ JUNIPER/ BROCADE/HP		
61	RELAYS	OMRON/ TELE MECHANIQUE/ HONEYWELL/ OEN/ P&F/ GM		
62	OVERSPILL DETECTOR	DANIEL/ TECHNICA/ WOODFIELD		
63	UNIVERSAL HAND HELD CALIBRATOR(HART PROTOCOL)	YOKOGAWA/ EMERSON/ HONEYWELL		
64	ELECTRONIC DISPLAY UNIT	MAGNETO DYNAMICS/ IRA		
65	ESD PUSH BUTTON	SUDHIR SWITCH GEARS (P) LTD/ BALIGA/ FLAMEPACK/ FCG FLEXPRO/ EX-PROTECTA/		
66	MANUAL CALL POINTS	SUDHIR SWITCH GEARS (P) LTD/ BALIGA/ FLAMEPACK		
67	UTP/COMMUNICATION CABLE AND PASSIVE COMPONENTS	AMP/ SCHNEIDER/ ADC-KRONE/ SYSTIMAX/ CORNING		
68	ADDITIVE INJECTION SKID & PANEL FOR BLUE DYE / MARKER / POWER / TURBO	ROCKWIN/ CRYOGENIC/ DANIEL/ HONEYWELL ENRAF/ M&F/IDEX/FMC TECHNOLOGIES		
69	PROXIMITY CARDS	HID/ HONEYWELL/ SCHNEIDER ELECTRIC/ SIEMENS/BOSCH/ CARDAX		
70	BULK POWER SUPPLY	DELTA/ LAMDA/ MITSUBISHI/ SIEMENS/ PHONEIX / COSEL /WEIDMULLER		
71	LARGE VDU	LG/ SAMSUNG/ SONY		
72	SEAL ENTRY DEVICE	STAHL/ DANIEL/ MTL (EXTEC) / P&F/ADVANCED SYSTEK/ CONTREK		
73	TFMS SOFTWARE	SAAB/ ENRAAF/ E&H		
74	MAGNETIC LEVEL GAIGE/INDICATOR	KROHNE/ K-TEK/ MAGNETROL/ BLISS ANAND/ KLINGER FLUID CONTROL GMBH/ KSR KUEBLER NIVEAUMESS-TECHNIK AG/ LEVCON INSTRUMENTS PVT LTD/ NIHON KLINGAGE/ PHOENIX SYSTEMLEMENTE UND MESSTECHNIK/ CHEMTROLS INDUSTRIES LTD		
75	ORIFICE PLATE & FLANGES ASSEMBLY	MICRO-PRECISION/ IL/ STAR-MECH/ EUREKA INDUSTRIAL EQUIPMENTS/GENERAL INSTRUMENTS/ BALIGE LIGHTING EQUIPMENTS.		
76	CABLE TRAYS	INDIANA/ PREMEIR/ ELCON/ SUMIP /VSL INSTRUMENTS /RELIANCE CABLE TRAYS/INDIAN CABLE TRAYS/SADHANA/ PREFAB ENGINEERS		

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77	GAS DETECTORS	MSA/ DETECTION INSTRUMENTS/ DETECTOR ELECTRONICS/HONEYWELL ANALYTICS/ GENERAL MONITORS/ RIKEN KEIKI		
78	CANOPIES(FRP)	FIBROCHEM/ SABRE- NISON CONSULTANTS		
79	PREFABRICATED HOOKUPS	TBVHOOKUPS/EMERSONHOOKUPS/SCHNEIDER CLOSE COUPLINGS/ PARKER INSTRUMENTATION / COMFIT / ASTEC /		
80	INSTRUMENT AIR MANIFOLD(SS)	TECHNOMATIC CONTROLS/HYDROPNEUMATICS/SWAGELOK INDIA		
81	INSTRUMENT TUBING AND FITTINGS(SS)	SWAGELOK/HOKE /PARKER/SANDVIK/ ASTEC/ HEAVY METALS & TUBES LIMITED(MEHSANA)/ JINDAL SAW LTD (NASHIK WORKS)/ NUCLEAR FUEL COMPLEX/ RAJENDRA MECH INDUSTRIES LTD/ RATNAMANI METALS AND TUBES LTD/ SANDVIK ASIA LIMITED (AHMEDABAD) / COMFIT		
82	COPPER TUBES(COATED/BARE)	1 ALCOBEX METALS (PVT) LTD INDIA  2.RAJCOMETALINDUSTRIES P LTD(FORM.H092) INDIA		
83	MCB's	SIEMENS/ HAVELL'S/ MERLIN GERIN/ SCHNEIDER/ LEGRAND/ HAGER		
84	PUSHBUTTONS RESET FOR HOOTERS	BALIGA/ CEAG FLAMEPROOF/ FEPL/ FCG/ MEDC/ KHERAJ/ TECHNIK/SUDHIR SWITCH GEARS		
85	BEACONS			
86	HOOTERS			
87	AFR	SHAVO-NORGREN/ MARSH-BELLOFRAM/ PLACKA/ SCHRADER- SCHOVILL.		
88	SOV'S	ASCO/ ROTEX/ HERION/ NORGREN		
89	TB'S	WAGO/ PHEONIX/ WEIDMULLER		
90	FUSES	BUSSMAN/SIBA		
91	VIBRATING TYPE LEVEL SWITCH (SIL3)	E&H/ VEGA/EMERSON		
92	MEDIA CONVERTER (OFC TO RS485 AND SERIAL TO ETHERNET)	PHOENIX/ATOP/CISCO/PERLE/BLACKBOX		
93	SURGE PROTEC-TION DEVICES	MTL/ OBO-BETTERMANN/ PHONIEX/DEHN/CITEL		
94	CABLE GLANDS	EX-PROTECTA/ BALIGA LIGHTING EQUIPMENTS PVT LTD./ GOVAN/ RITTAL/ FLEXPRO/ FLAMEPROOF CONTROL GEARS/ HENSEL / FCG / COMET / SUDHIR SWITCHGEARS /		
95	MOTORISED ACTUATOR (MOV)	1. AUMA  2. ROTORK  3. FLOWSERVE  4. EIM  5. BIFFI		



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96	LIMIT SWITCH	1. PEPPERL + FUCHS (INDIA) PVT.LTD. 2. ALLEN BARDLY (ROCKWELL AUTOMATION) 3. OSNA 4. TURCK	
97	INSTRUMENT CABLE TRAYS / DUCT(GI)	1. VSLINSTRUMENTS 2. OM KARESHWAR ENGINEERING 3. RUKMINI 4. INDIAN CABLETRAYS 5. RELIANCE CABLETRAYS 6. SADHANA ENGGCORPORATION 7. PREFABENGINEERS	
98	MAGNETIC FLOWMETER	1. Emerson 2. Yokogawa 3. Forbes Marshall 4. E&H	

### MECHANICAL/PIPING

SL NO.	ITEM DESCRIPTION	APPROVED MAKES / BRAND/VENDOR
1	CENTRIFUGAL PUMPS	1. FLOWSERVE PUMPSLTD.
		2. KIRLOSKAR EBARALTD.
		3. KSB PUMPSLTD.
		4. SAM TURBO INDUSTRIESLTD.
		5. SULZER PUMPSLTD.
		6. KIRLOSKAR BROTHERSLTD.
2	DOSING / METERINGPUMPS	1. SWELORE ENGINEERING PVT. LTD.MUMBAI.
		2. ASIA-LMI PVT. LTD/CHENNAI.
		3. SHAPOTOOLS/MUMBAI.
		4. ALWEYN PUMPS & SYSTEMS LTD.MUMBAI.



### STRUCTURAL

SL NO.	ITEM DESCRIPTION	APPROVED MAKES / BRAND/VENDOR
1	STRUCTURALSTEEL	1. SAIL
		2. RINL
		3. TISCO
		4. JINDAL
3	PAINT	1. BERGERPAINTS
		2. SHALIMARPAINTS/
		3. AKZO-NOBELCOATINGS/
		4. SIGMACOATING/
		5. ASIANPAINTS/
		6. GRAUER & WEIL (INDIA)LIMITED.

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**COMMUNICATION/ IT INFRASTRUCTURE AND ACS SYSTEMS**

Sl.No.	DESCRIPTION OF THE ITEM	APPROVED MAKES/BRANDS/VENDORS
1	TELEPHONE/ IP-PBX	CISCO/AVAYA/SIEMENS/TADIRAN/ERICSSON
2	FLAMEPROOF TELEPHONE INSTRUMENTS	STAHL/ BALIGA/ FLAMEPACK/ FCG/ Flexpro
3	TELEPHONE INSTRUMENTS/ WEATHER PROOF	FLAMEPACK/ BALIGA/STAHL
4	MDF/TJB	KRONE
5	TELEPHONE CABLES	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/ TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ RR KABLE/ CHORDS/GEMSCABLE/ DELTON CABLES/ ELKAY TELELINKS/ BIRLAERICSSON
6	POWER CABLE	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/ TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ RR KABLE/ CHORDS/ GEMSCABLE/ CCI/ LAPP
7	LOUD SPEAKER CABLE	CCI / UNIVERSAL / NICCO /POLYCAB INDUSTRIES/ DELTON / RAVICAB
8	LED MONITORS DISPLAYSCREENS- INDUSTRIAL GRADE/SUITABLE FOR 24 X 7 OPERATION	SAMSUNG/SONY/ LG
9	JUNCTION BOX & CABLEGLAND	BALIGA/ CEAG FLAMEPROOF CONTROL GEARS/ EX PROTECTA/ FLAMEPROOF EQPT. (P) LTD/ STERLING SWITCH GEARS CNTROLS (P) LTD./ SUDHIR SWITCH GEAR(P) LTD./ FLAMEPACK
10	POWER CABLE	UNIVERSAL CABLE/ FINOLEX/ FORT GLOSTER /CCI/ DELTON/LAPP/ RPG/ RELIANCE/ HAVELL/ POLYCAB/ CORDS/ KEI
11	FIBER OPTIC CABLE	AMP/KRONE/LUCENTAT&T/ FINOLEX/ DLINK/ HCLCOMNET (COMMSCOPE)/ SIMON/ TYCO/ ADS-KRONE/ HIMACHAL FUTIRISTIC COMMUNICATIONS/ BIRLA ERICSSON/ KABEL RHEYDT/ UNIFLEX CABLES/ BELDEN/ SYSTIMAX/ CORNING
12	ETHERNET SWITCHES	CISCO/ FOUNDRY/ NORTEL/ N-TRON/ MOXA/ HIRSCHMANN/ JUNIPER/ BROCADE/HP
13	UTP/COMMUNICATION CABLE AND PASSIVECOMPONENTS	AMP/ SCHNEIDER/ ADC-KRONE/ SYSTIMAX/ CORNING
14	NETWORK CORE/DISTRIBUTIONSWITCH & MANAGED ACCESS SWITCHES	CISCO/ FOUNDRY NETWORKS/ NORTEL/ ALLIED TELESYS/EXTREME/ N-TRON/ MOXA/ HIRSCHMANN/ NETGEAR/ JUNIPER
15	INDUSTRIAL NW SWITCH AND NW DEVICES	MOXA/ HIRSCHMAN/ ENTRON/ CISCO/ NETGEAR/ JUNIPER
16	NETWORK ENCLOSURES	APS PRESIDENT/ RITTAL/ NETRACK
17	DETECTORS AND DEVICES (PHOTO ELECTRIC/ HEAT/ THERMAL) UL /FM /ULC /MIL /LPC APPROVED	APOLLO/ EDWARDS / HONEYWELL / NOTIFIER/ SYSTEM SENSOR
18	BREAK GLASS TYPE MANUAL CALL POINTS INCLUDING HANDSETS. UL /FM /ULC /MIL /LPC APPROVED	SIEMENS / EDWARDS / HONEYWELL / NOTIFIER



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19	CABLES FOR DETECTOR LOOPS	FINOLEX /DELTON / FORTGLOSTER / INCAB / RAVICAB
20	POWER CABLE	FINOLEX / DELTON / POLYCAB / FORTGLOSTER / RAVICAB
21	GI CONDUITS	BEC /NICCO /ZENITH
22	CABLE TRAYS	INDIANA CABLE TRAYS/HOPES METAL/ GRAM ENGG. GLOBE ELECTRICALS/PREMIER POWER PRODUCTS
23	PLANT COMMUNICATION SYSTEM	NEUMANN/ INDUSTRIONICS
24	TELEPHONE JELLY FILED JOINTING KITS	AS PER JOINTING CONTRACTOR WHO SHALL SUBMIT DETAILS TO MRPL FOR VETTING PRIOR TO PLACING PURCHASE ORDER
25	WIRELESS TETRA COMMUNICATION SYSTEM	ARYA COMMUNICATIONS & ELECTRONICS SERVICES/ LINKWELL ELECTRONICS(P) LTD/ MOBILE COMMUNICATIONS(INDIA) PVT LTD
26	MEDIA CONVERTER (OFC TO RS485 AND SERIAL TO ETHERNET)	PHOENIX/ATOP/CISCO/PERLE/BLACKBOX
27	LEVEL SWITCH(DISPLACER TYPE)/LEVEL GAUGE	EMERSON, YOKOGAWA, FOBESMARSHALL, E&H/TOKIO KEISO/MAGNETROL
28	RODENT REPELLENT SYSTEM	MASCER/R S CAT

#### FDA

SL. NO.	DESCRIPTION OF THE ITEM	APPROVED MAKES/BRAND/VENDORS
1	DETECTORS AND DEVICES (PHOTO ELECTRIC/ HEAT/ THERMAL) UL /FM /ULC /MIL /LPC APPROVED	HONEYWELL / NOTIFIER/ SIEMENS/TYCO
2	FIRE ALARM CONTROL PANELSUL /FM /ULC /MIL /LPC APPROVED	SIEMENS / HONEYWELL / NOTIFIER/ TYCO
3	BREAK GLASS TYPE MANUAL CALLPOINTS INCLUDING HANDSETS. UL /FM /ULC /MIL /LPC APPROVED	SIEMENS / EDWARDS / HONEYWELL NOTIFIER
4	CABLES FOR DETECTOR LOOPS	FINOLEX /DELTON / FORTGLOSTER / INCAB / RAVICAB
5	POWER CABLE	FINOLEX / DELTON / POLYCAB / FORTGLOSTER /RAVICAB
6	SIGNAL CABLE	DELTON / VINDHYA TELELINK / RAVICAB / FINOLEX
7	GI CONDUITS	BEC /NICCO /ZENITH
8	BATTERIES	AMCO/SABNIFE/AMARA RAJA/EXIDE
9	COMMUNICATION (JELLY FILLED)AND FIRE ALARM CABLES	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ RR KABLE/ CHORDS/ GEMSCABLE/ DELTON CABLES/ ELKAY TELELINKS/ BIRLA ERICSSON





	<b>MRPL Marketing Terminal Project at Devangonhi, Bangalore</b>			
	<b>Marketing Infrastructure Projects, MRPL</b>			
	<b>VENDOR LIST</b>	Tender No :		3200000591
		Document No:		-
	Rev :	0		



### ACCESS CONTROL SYSTEM

Sl. No	INSTRUMENTS	APPROVED MAKES/VENDOR/BRAND
1.	ACCESS CONTROL SYSTEM	HONEYWELL/ JOHNSON CONTROLS/SIEMENS/CARD KEY/USA/BOSCH/EDWARDS / SCHNEIDER / CARDAX/ HID/GALLAGHER
2.	TURNSTILE	ELKOSTA/SHIVANANDA/MAGNETIC INDIA/ TANSA/ MAGNETIC AUTO CONTROL/ SIVANANDA ELECTRONICS/AUTOMATIC SYSTEMS/ BOOM EDAM/ CAME/ DORSET KABA/ FAAC/ GUNNEBO/ SAIMA/GALLAGHER
3.	PROXIMITY CARD READER/BIO-METRIC READER	HONEYWELL/SIEMENS/BOSCH/GALLAGHER/HID/SCHNEIDER/JOHNSON CONTROLS
4.	DOOR FRAME METALLIC DETECTOR /HAND HELD DETECTOR	ELEKTRAL/GODREJ/RAPISCAN/SIVANANDA ELECTRONICS
5	SWING GATE	MAGNETIC AUTO CONTROL/AUTOMATIC SYSTEMS/BOOM EDAM/CAME/DORSET KABA/GUNNEBO

### CCTV

Sl. No.	Description of the item	APPROVED MAKES/VENDOR/BRAND
1	CCTV CAMERAS	PELCO/ HONEYWELL/ BOSCH/ AXIS/ / AMERICAN DYNAMICS/ INFINOVA/ SIEMENS/ ARECONT VISION
2	VIDEO MONITORING SOFTWARE	VERINT/ QOGNIFY (NICE)/ PROXIMEX/ GENETEC/ 2020 IMAGING/ I2V/ VIDEONETICS/ MILE STONE/SIEMENS/ HONEYWELL
3	SERVER/WORKSTATION & COMPUTER MONITORS	DELL/HP/ IBM
4	LCD/LED DISPLAYS SCREENS-INDUSTRIAL GRADE/ SUITABLE FOR 24 X 7 OPERATION	SONY/SAMSUNG/LG
5	NETWORK SWITCHES/ MEDIA CONVERTERS (OUTDOOR INDUSTRIAL GRADE)	RUGGEDCOM/ MOXA/ HIRSCHMANN/ PHONIEX/ N-TRON/ HP/ CISCO/ MOXA/ ALLIED TELESYS/ JUNIPER/ COMNET/ BROCADE
6	NETWORK SWITCHES/ MEDIA CONVERTERS (INDOOR)	NORTEL/CISCO/ ALLIED TELSIN/BROCADE/ HP/MOXIA/ JUNIPER/ HIRSCHMANN//COMNET/PHOENIX/



		<b>MRPL Marketing Terminal Project at Devangonhi, Bangalore</b> <b>Marketing Infrastructure Projects, MRPL</b>			
		VENDOR LIST			
				Document No:	-
				Rev :	0
7	FIBER OPTIC CABLES (SINGLE & MULTIMODE)	LUCENTAT&T/ FINOLEX/ DLINK/ HCLCOMNET (COMMSCOPE)/ SIMON/ TYCO/ / ADS-KRONE/ HIMACHAL FUTIRISTIC COMMUNICATIONS/ BIRLA ERICSSON/ KABEL RHEYDT/ UNIFLEX CABLES/ BELDEN/			
8	PATCH CORDS (FIBRE/ UTP) AND PASSIVE NETWORKING COMPONENTS	LUCENT-AT&T/ FINOLEX/ / HCLCOMNET (COMMSCOPE)/ SIMON/ TYCO/ ADS-KRONE/SCHNEIDER/ CORNING/ SYSTIMAX			
9	CABLES/POWER CABLES	ASSOCIATED CABLES PVT. LTD./ DELTON/ FINOLEX/ASSOCIATED FLEXICABLES & WIRES/ DIAMOND/ NICCO/ RELIANCE ENGG./ CORDS CABLES/ SUYOG CABLES/ THERMO CABLES/ KEI INDUSTRIES/			
10 (A)	SYSTEM PANELS/ CABINETS	RITTAL/ HOFFMAN/ STAHL			
10 (B)	FIELD JUNCTION BOXES	SUDHIR SWITCHGEAR/ BALIGA/ FLAMEPROOF EQUIPMENTS/ FLEXPRO/ FLAMEPROOF CONTROLGEARS/ GOVAN INDUSTRIES/ PROMPT ENGINEERING/ EXPROTECTA/ STAHL			
11	CABLE TRAYS	INDIANA CABLE TRAYS/ HOPES METAL/ GRAM ENGG. GLOBE ELECTRICALS/ PREMIER			
12	TERMINAL BLOCKS	PHONIEX/WAGO/WELDMULLER			
13	MINIATURE CIRCUIT BREAKERS	MERLIN GERIN/ SCHNEIDER ELECTRIC/ SIEMENS			
14	SURGE PROTEC-TION DEVICES	MTL/ OBO-BETTERMANN/ PHONIEX/DEHN/CITEL			
15	FUSES	BUSSMAN/ SIBA			
16	CANOPY	FIBROCHEM/ SABRE-NISON / LOTUS FIBER			
17	NAS/SAN	ETAPP/EMC/HP/FUJITSU/HITACHI/DELL			

	<p>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</p> <p>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</p>	
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PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY,  
MANGALORE, KARNATAKA

TENDER NO. 3200000590

PRICE PART / SCHEDULE OF RATES

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

### PREAMBLE TO SCHEDULE OF RATES

**NAME OF WORK: PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY,  
MANGALORE, KARNATAKA**



**Tender No. : 3200000590**

**NAME OF BIDDER: M/s.....**

1. The bidder should accept in Toto the Technical specification and Scope of work given in the Tender with no deviation as per clauses of the tender document.
2. Techno commercially acceptable bids will be evaluated on overall L-1 basis i.e. lowest landed cost to MRPL.
3. MRPL intends to award the contract to 2 (Two) Contractors in the ratio of 60:40 to L1 and next bidder at L1 rate.
4. Counter offer/s would be offered to all other bidders, i.e., L2, L3 and so on for acceptance of L1 rate by giving minimum of 2 working days. Bidders who have accepted and confirmed the counter offer within the specified time limit will be ranked in the order of original ranking and will be considered for award of order to the first bidder in the order of their ranking.
5. If any of the bidders do not confirm within the specified time limit, it will be construed that the bidder has not accepted the counter offer.
6. MRPL has the discretion to negotiate with L1 bidder, if rates offered by L1 bidder are not acceptable to MRPL. In such cases, negotiated/counter offer will be construed as L1 and such negotiated L1 will be offered to other qualified bidders also.
7. In case of a tie in same rate being quoted by more than one party, then the bidder with higher turnover (3 years Average Annual turnover total as per BQC#) will be considered as lowest ranking tenderer.
8. In case, if the number of successful bidders are less than the MRPL requirement of Two successful bidders, MRPL reserves the right to re-distribute the left over balance work available to the successful L1 bidder, provided the bidder meet the BQC for the revised work order value.
9. The Schedule of Prices/ Schedule of Rates / FORM SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 shall be read in conjunction with all other sections of this Bidding Document.
10. The Contractor is deemed to have studied the drawings, specifications and details of works to be done including scope of work, scope of supply and technical specification within the Time Schedule and should have acquainted himself of the conditions prevailing at site.
11. The quoted price shall be deemed to be inclusive of all taxes / duties / cess / levies / fees etc. except "Goods and Services Tax" (hereinafter called GST) (i.e., IGST or CGST and SGST/UTGST as applicable in case of interstate supply or intra state supply respectively and GST compensation Cess if applicable), except as specifically provided to the contrary in the Special Conditions of Contract.
12. Bidders shall quote their prices as percentage variation in Form SP-0 on Total estimated

**Tender No:3200000590**

**Bidder's Seal & Signature**



	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

value. This percentage variation as quoted by the bidder will apply uniformly to all items of SOR given in FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4.

13. Bidder shall indicate only the Increase/Decrease on Total estimated value in terms of percentage upto 2 decimal places in the "Schedule of Prices" sheet (Form SP-0). Bidder shall not change the Pre-filled rate/ amount indicated in "Schedule of Rates". Bidder shall refer the total estimated cost i.e. The Final Amount indicated in Forms SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 (PRE-FILLED short description of SOR) for respective parts provided in the Bidding Document or its Amendment(s), if any.
14. Bidder shall not change the pre-filled rates in SP-0, item description or header/ footer. MRPL will not accept any deviation or qualification or partial quotation for a line-item.
15. Any ambiguity or conflict with other documents included in the Tender package will require the more stringent interpretation in favor of MRPL for pricing of SOR line-item.
16. The pre-filled rates are provided in the FORMS tabulated below for the complete work-scope-MRPL Refinery Modification Work and PMHBL - Mangalore Premises Modification Work. Based on this pre-filled rates in the various forms, bidder shall quote his +/- percentage variation in FORM SP-0.

	SP-0	Summary carry forward of totals from each of FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4
	SP-2A	Piping Painting : Indicative quantities with pre-filled unit-rates
	SP-2C	Piping Valves Installation: Indicative quantities with pre-filled unit-rates
	SP-2D	Piping Specialty Items Installation: Indicative quantities with pre-filled unit-rates
	SP-2E	Pipe Supports Installation : Indicative quantities with pre-filled unit-rates
	SP-2F	Piping Erection/ Installation: Indicative quantities with pre-filled unit-rates
	SP-2G	Piping SP Items Supply and Installation Works
	SP-4	Mechanical Erection / Installation Indicative quantities with pre-filled unit-rates

17. Total Contract Value (excluding GST) in FORM SP-0 will be the basis for evaluation and award.
18. Quantities mentioned in FORMS are indicative and invoicing and payment will be based on actual as-measured quantity after execution. However, unit-rates are to be quoted

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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independent of any fluctuation in the as-measured quantity. These unit-rates are valid for the complete duration of the project and must consider inflation and other project exigencies.

19. MRPL reserves the right to cancel / curtail / delete any item or group of work if necessary. Such a step shall not be construed as reason for changing the quoted price.
20. The quantities shown against the various items are only approximate and may vary to any extent individually as per tender document.
21. The Total Contract Value in FORM SP-0, shall be deemed to be inclusive of all charges, taxes & duties, municipality tax, statutory levies, government permits, enabling facilities, site temporary facilities, insurances, HSE facilities, Quality Assurance costs, Site Office and Home Office costs, etc., but exclusive of “Goods and Service Tax” (GST).

The GST as legally leviable & payable by the Contractor under the provisions of applicable law(s) shall be reimbursed by MRPL as per contractor’s GST invoice to MRPL.

Prices, taxes, duties including GST on any transaction between contractor and sub-supplier / sub-contractor shall be included in the lumpsum price quoted by the Bidder.

22. Total Contract Value in FORM SP-0 must include the cost of all inspections including Third-Party inspection by listed approved inspection agencies.
23. All Bidder supplied material must include the cost of freight & insurance to deliver material at the Project Site.
24. Total Contract Value in FORM SP-0 shall include but not be limited to :
  - The cost of mobilization including but not limited to mobilization of vehicles, movements, machinery, equipment, gear, tools, tackles, and other items and goods and personnel necessary for or to perform the works contemplated under the Contract.
  - The cost of all construction plants and equipments, vehicles, movements, supply of water and power, construction of temporary roads and access, temporary works, pumps, wiring, pipes, scaffolding, de-watering, disposal of hydro-test water, piling, shuttering and other materials, supervision, labour, fuel, stores, geo-technical investigation.
  - All supervision charges, establishment charges, overheads, contingencies, site organization, charges etc.
  - The incidental cost arising out of punch list/ check list issued by commissioning team / PMC/ Owner /operation group during pre-commissioning / commissioning for smooth and trouble free operation of the system/ units.
  - All Mandatory Spares/ Pre-Commissioning spares, Commissioning Spares, Defects Liability Period spares and spares required as per the spares philosophy for all Bidder-supplied items.
  - Warehouse storage and Materials Management of Contractor-sourced material.
  - Preservation of installed and un-installed items for all free-issue and



	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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Contractor-sourced material.



- All truck loading and unloading of free-issue material, multiple handling, interface with other site contractors, re-work and re-installation if necessary, continuity testing, earthing, wire-markers and all HSE compliances.
- All structural steel supports required for installation, welding, cutting, grouting, painting, stenciling, required civil and mechanical work for installation, work at any height/ elevation, etc. Also any construction services required for completing the works in all respects including calibration, testing, configuration, integration wherever applicable.
- All temporary camp facilities, security, site office, site accommodation, IT facilities and local transportation charges.

25. Warehousing and material management of Free-issue material is by MRPL/ PMC. Bidder is responsible to provide cranes, material handling equipment and other resources to un-load and load free-issue material from MRPL site warehouse. Full material reconciliation will be required for free-issue material.
26. MRPL/PMC reserves the right to interpolate or extrapolate the rates for any new item of work not covered in Schedule of Rates/ Price from the similar items already available in schedule of rates.
27. All items of work mentioned in FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 shall be carried out as per the specifications, drawings and instructions of Engineer-in-Charge and the rates are deemed to be inclusive of all materials, consumables, labour, supervision, tools & tackles and detailing of construction/fabrication drawings, isometric wherever required as per detail specifications and conditions of the Contract.
28. Quoted price shall include cost of any other supplies/work(s)/Services not specifically mentioned in the Bidding Document but are necessary for the efficient, trouble free operation of the complete Plant and to make this package job complete, irrespective of, whether the above unspecified supplies/work(s)/services are specifically mentioned in the bidder's bid or not.
29. Quoted Rates are fixed and firm for the entire duration of the Contract Agreement and any extension thereof and are not dependent on any increase / decrease in quantities. Quantities provided in Schedule of Rates (SOR) are indicative.
30. The Price for the Supply component is all-inclusive and must be the landed price at the Project Site (**INCOTERMS 2021: DDP Price**).
31. All type of Insurance to be taken by the Contractor as per provisions of the Bidding document shall be included in the quoted PRICE.
32. The quoted price shall be inclusive of first-fill, preservation of installed and uninstalled items, all consumables, incidentals & accessories, wire-markers, earthing, ferrules, fasteners for the entire duration of the Installation & Commissioning Period and subsequent Defects Liability Period.
33. No claim shall be entertained during currency of this Contract towards high/low quoted items due to quantity variation of any item individually or for non-operation of any item.





	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b> <b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL</b> <b>REFINERY, MANGALORE, KARNATAKA</b> <b>VOLUME I : COMMERCIAL</b>	
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34. Free-issue Package items will have respective Vendor Supervision for testing and commissioning provided by the Owner. Bidder must assist and interface with Vendor Representative for these activities to ensure successful commissioning.
35. Unit-Rates shall include Procurement Services for all Bidder-procured items ( Data Sheets, RFQs, TBEs, price negotiation, Purchase Order placement, expediting, Factory stage-wise inspection, Third party inspection, F.A.T including integrated F.A.T, logistics handling, site storage) and shall include other services including but not limited to : clearance of the goods through custom and port clearance (for imported material) including filling and/or filling of all custom manifests, bill of entry, and custom declarations and other documents as may be required for the clearance of the goods from custom or port authorities ; stevedoring, clearing, forwarding, and handling services as required for clearing, forwarding, and handling imported and indigenous materials and consignments including payment of any demurrage, wharfage, port charges, siding charges, retention charges, detention charges or other charges whatsoever and howsoever designated or levied by any railway, airport, ship and/ or other authorities for or in connection with the loading, unloading or deletion of any materials or vessels or other means of transport beyond the free period or unloading, clearance, retention or detention of loading, as the case may be, provided by the relevant authorities in this connection.
36. Construction materials such as structural supports, scaffolding, etc shall be included in the quoted pricing.
37. Obligation of the Bidder is not limited to the quantities indicated in the Schedule of Rates along with his bid or in the billing schedules after award of work. Contractor shall carry entire scope of Work at the agreed rates regardless of any final re-measured actual quantity.
38. The quoted price shall be deemed to include and cover (unless otherwise expressly specified to the contrary in any contract document(s)):
- a) The cost of all indemnities under the Contract, and insurance premiums on insurance required in terms of the Contract documents or otherwise under any law, rule or regulation, and the cost of all risks whatsoever (foreseen and unforeseen) including but not limited to risks of delay or extension of time or reduction or increase in the work or scope of work and/or cancellation of Contract, and/or accident, strike, civil commotion, war, strike, labour trouble, third party breach, fire, lightning, inclement weather, storm tempest, flood, earthquake and other acts of God, Government regulation or imposition or restriction, dislocation of road, rail, sea, air and other transport, access or facility, flooding of site and/or access roads and approaches thereto, suspension of work, sabotage and other cause whatsoever.
  - b) The cost of all Third-Party inspections, inspections, calibrations, tests and certificates relative thereto including third party tests and/or inspections where necessary, and of items, instruments, plant and/or tools and appliances required to conduct such inspection and tests.
  - c) The cost of all Third-party inspections for Quality Assurance during the Supply, Installation and Commissioning phase of the project.
  - d) The cost of all approvals / inspections / supervision and other charges from government and local entities.
  - e) The cost of all statutory charges, fees, royalties, etc. to be paid to government departments including all liasoning charges and incidentals.

	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	
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- f) The cost of all materials supplied and/or intended for incorporation in the works supplied within the scope of work, delivery thereof to the job site, loading, transportation and unloading storage, security thereof, waste on materials, and return of empties and surpluses.
- g) The cost of all statutory charges, fees to be paid to statutory authorities for scope of work as per FORMS SP-2A, SP-2C, SP-2D, SP-2E, SP-2F, SP-2G, SP-4 including all liasoning charges and incidentals.
- h) The cost of all escalations (foreseen and unforeseen) including but not limited to increase in government taxes and duties, labour costs and material costs and other inputs whatsoever.
- i) All supervision charges, establishment's overheads, finance charges and other costs and expenses and charges to the Bidder, and the Bidders profit of and relative to the work and/or supply.
- j) The cost of all deductions, reductions, discounts, adjustments and withholdings whatsoever under or in connection with the contract.

**39.** The unpriced technical bid shall contain the SP-0 format indicating "Quoted" against each respective item with no exception or deviation.

	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE	
	<b>PIPING &amp; MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA VOLUME I : COMMERCIAL</b>	

		<b>Mangalore Refinery and Petrochemicals Limited (A subsidiary of Oil and Natural Gas Corporation Limited)</b>				
<b>Instructions to Bidders: Complete all the Highlighted Cells before submission / uploading</b>						
<b>FORM: SP-0 ELECTRICAL CONSTRUCTION TENDER(TOTAL CONTRACT VALUE)</b>						
<b>Tender No:</b>	3200000590					
<b>Tender Description :</b>	PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY, MANGALORE, KARNATAKA					
<b>Name of Tenderer :</b>						
SI	Item Code	Description of items	SOR Value in INR	Service Tarrif Code *	SOR Rate in % (+/-)	Amount in INR
1		PIPING & MECHANICAL MODIFICATION WORKS INSIDE MRPL REFINERY	<b>76,683,928.00</b>			76,683,928.00
<b>Total Amount (Rs.) Excluding GST</b>						<b>76,683,928.00</b>
			GST			0.00
<b>Total Cost after GST</b>						<b>76,683,928.00</b>
				Rupees Seven Crore Sixty Six Lakh Eighty Three Thousand Nine Hundred Twenty Eight Only		

Sl. No.		Material Code	Description	Qty	UOM	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
1.0			<b>PAINTING:</b> Supply of paints and primers, preparation of surfaces and application of primer (all relevant number of layers) and finish paints, including rubdown and touch up of shop primer wherever required, providing scaffolding for all heights, labor, material, tools and tackles, consumables, supervision etc. to complete the work in all respects as per MRPL Document no. 750-20005-GEN-G-EDB-9122, drawings and directions of engineer-in-charge for all types of un insulated piping as specified including all pipes, fittings, flanges, supports, valves etc. Surface preparation by Shot Blasting. The identification marks of the piping and joints shall be noted before blasting and the same shall be transferred on primed surface with polyurethane paint (F2) or as per the instruction of Engineer-in-Charge. All joints (fabrication as well as erection joints) shall be left unpainted till hydro-testing.	6458	SQ. Meters	1450.00	9364100
<b>SUBTOTAL SP-02A</b>						1450.00	9364100.00



**Mangalore Refinery and Petrochemicals Limited**  
 (A subsidiary of Oil and Natural Gas Corporation Limited)



**Instructions to Bidders: Complete all the Highlighted Cells before submission**

**FORM: SP-2A PIPING - (PAINTING)**

Tender No: -

Tender Description : MARKETING INFRASTRUCTURE PROJECTS,

Name of Bidder :



**Mangalore Refinery and Petrochemicals Limited**  
(A subsidiary of Oil and Natural Gas Corporation Limited)



**Instructions to Bidders: Complete all the Highlighted Cells before submission**  
**FORM: SP-2C PIPING - ATTACHMENT -2 (VALVE) - FREE ISSUE BY THE COMPANY**

Tender No:	
Tender Description:	MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE
Name of Bidder:	



Lifting, Unloading and Transportation of items from trailers / trucks and moving the same to the site, storage, fabrication / erection / installation, Testing, hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built document, as per the bidding documents of all items mentioned here with

Sl. No.	Item	Piping Class	Commodity Code	Size 1 (inc)	Item Description	Qty	UOM	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
1	Ball Valve	A1A	543012Z20	0.75"	Full Bore Ball Valve, Body-ASTM A105/A 216 GR.WCB, TRIM- 13% CR. Steel, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-54301	13	NOS.	500.00	6500
2	Ball Valve	A1A	543012Z20	1"	Full Bore Ball Valve, Body-ASTM A105/A 216 GR.WCB, TRIM- 13% CR. Steel, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-54301	14	NOS.	500.00	7000
3	Ball Valve	A1A	543012Z20	2"	Ball Valve, Body-ASTM A105/A 216 GR.WCB, TRIM- 13% CR. Steel, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-54301	11	NOS.	1,000.00	11000
4	Ball Valve	A1A	543012Z20	3"	Ball Valve, Body-ASTM A105/A 216 GR.WCB, TRIM- 13% CR. Steel, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-54301	3	NOS.	1,500.00	4500
5	Ball Valve	A1A	543012Z20	4"	Ball Valve, Body-ASTM A105/A 216 GR.WCB, TRIM- 13% CR. Steel, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-54301	3	NOS.	2,000.00	6000
6	Ball Valve	A1A	54942Z20	28"	Full Bore Ball Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, Body Seat-RPTFE, API-6D, FLGD, 150#. ASME B16.47 B, RF/125 AARH, SHT NO.- 54934	2	NOS.	16,800.00	33600
7	Ball Valve	A1M	543AAZ20	0.5"	Full Bore Ball Valve, Body-ASTM A182 GR.F316, TRIM- SS316, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-543AA	3	NOS.	500.00	1500
8	Ball Valve	A1M	543AAZ20	0.75"	Full Bore Ball Valve, Body-ASTM A182 GR.F316, TRIM- SS316, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-543AA	1	NOS.	500.00	500
9	Ball Valve	A1M	543AAZ20	1"	Full Bore Ball Valve, Body-ASTM A182 GR.F316, TRIM- SS316, Body Seat-RPTFE, BS-5351, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-543AA	6	NOS.	500.00	3000
10	Check Valve	A1A	53301Z20	12"	Check Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, BS 1868, FLGD, 150#, ASME B16.5, RF/125 AARH, SHT No. - 53301	2	NOS.	6,000.00	12000
11	Check Valve	A1A	53925Z20	28"	Check Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-594, FLGD, 150#, ASME B16.47 B, RF/125 AARH, SHT NO. -53925	1	NOS.	21,000.00	21000
12	Check Valve	A1A	-	16"	Dual Plate Check Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-594/6D, FLGD, 150#. ASME B16.5, RF/125 AARH.	2	NOS.	8,000.00	16000
13	Check Valve	A1M	53061Z20	1"	Check Valve, Body-ASTM A182 GR.F316, TRIM-Stellited, BS-5352, SW, 800#, ASME B16.11 SHT No.-53061	1	NOS.	0.00	0
14	DBBV	A1A	58001Z20	12"	Double Block & bleed valve - 750117, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	6,000.00	6000
15	DBBV	A1A	58001Z20	12"	Double Block & bleed valve - 750114, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	6,000.00	6000
16	DBBV	A1A	58001Z20	14"	Double Block & bleed valve - 750103, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	7,000.00	7000
17	DBBV	A1A	58001Z20	6"	Double Block & bleed valve - 750101, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	3,000.00	3000
18	DBBV	A1A	58001Z20	6"	Double Block & bleed valve - 750104, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	3,000.00	3000
19	DBBV	A1A	58001Z20	6"	Double Block & bleed valve - 750115, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	3,000.00	3000
20	DBBV	A1A	58001Z20	6"	Double Block & bleed valve - 750116, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	3,000.00	3000
21	DBBV	A1A	58001Z20	8"	Double Block & bleed valve - 750112, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	4,000.00	4000
22	DBBV	B1A	58101Z20	8"	Double Block & bleed valve - 750111, Body-ASTM A216 GR. WCB, Plug - Hardened, API-6D, FLGD, 300#. ASME B16.5, RF/125 AARH, SHT No. - 58001	1	NOS.	4,000.00	4000
23	Gate Valve	A1A	51001Z20	0.5"	Gate Valve, SW, 800#. API-602, Body-ASTM A105, TRIM-Stellited, Stem-13% CR. Steel, SHT No.-51001	24	NOS.	0.00	0
24	Gate Valve	A1A	51001Z20	0.75"	Gate Valve, SW, 800#. API-602, Body-ASTM A105, TRIM-Stellited, Stem-13% CR. Steel, SHT No.-51001	140	NOS.	0.00	0
25	Gate Valve	A1A	51001Z20	1"	Gate Valve, SW, 800#. API-602, Body-ASTM A105, TRIM-Stellited, Stem-13% CR. Steel, SHT No.-51001	5	NOS.	0.00	0
26	Gate Valve	A1A	51001Z20	1.5"	Gate Valve, SW, 800#. API-602, Body-ASTM A105, TRIM-Stellited, Stem-13% CR. Steel, SHT No.-51001	3	NOS.	0.00	0
27	Gate Valve	A1A	51301Z20	10"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	4	NOS.	5,000.00	20000
28	Gate Valve	A1A	51301Z20	12"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	10	NOS.	6,000.00	60000
29	Gate Valve	A1A	51301Z20	12"	Full Port Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	1	NOS.	6,000.00	6000
30	Gate Valve	A1A	51301Z20	14"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	2	NOS.	7,000.00	14000
31	Gate Valve	A1A	51301Z20	14"	Full Port Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	6	NOS.	7,000.00	42000
32	Gate Valve	A1A	51301Z20	16"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	3	NOS.	8,000.00	24000
33	Gate Valve	A1A	51301Z20	16"	Full Port Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	1	NOS.	8,000.00	8000
34	Gate Valve	A1A	51301Z20	2"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	3	NOS.	1,000.00	3000
35	Gate Valve	A1A	51301Z20	28"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.47 B, RF/125 AARH, SHT No. - 51301	1	NOS.	21,000.00	21000
36	Gate Valve	A1A	51301Z20	3"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	2	NOS.	1,500.00	3000
37	Gate Valve	A1A	51301Z20	4"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	3	NOS.	2,000.00	6000
38	Gate Valve	A1A	51301Z20	6"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	3	NOS.	3,000.00	9000
39	Gate Valve	A1A	51301Z20	8"	Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	3	NOS.	4,000.00	12000
40	Gate Valve	A1A	51301Z20	8"	Full Port Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 150#. ASME B16.5, RF/125 AARH, SHT No. - 51301	2	NOS.	4,000.00	8000
41	Gate Valve	A1M	51061Z20	0.5"	Gate Valve, Body-ASTM A182 GR.F316, TRIM-Stellited, Stem - SS316, API 602, SW, 800#, ASME B16.11 SHT No.-51061	0	NOS.	0.00	0
42	Gate Valve	A1M	51061Z20	0.75"	Gate Valve, Body-ASTM A182 GR.F316, TRIM-Stellited, Stem - SS316, API 602, SW, 800#, ASME B16.11 SHT No.-51061	7	NOS.	0.00	0
43	Gate Valve	A1M	51061Z20	1"	Gate Valve, Body-ASTM A182 GR.F316, TRIM-Stellited, Stem-SS316, API-602, SW, 800#, ASME B16.11, SHT No.-51061	2	NOS.	0.00	0
44	Gate Valve	A1M	51361Z20	2"	Gate Valve, Body-ASTM A351 GR.CF3M, TRIM-SS316, API-600, FLGD, 150#. ASME B16.5, RF/125AARH, SHT No.-51361	3	NOS.	1,000.00	3000
45	Gate Valve	B1A	51401Z20	6"	Full Port Gate Valve, Body-ASTM A216 GR. WCB, Trim-13% CR. Steel, API-600, FLGD, 300#. ASME B16.5, RF/125 AARH, SHT No. - 51401	3	NOS.	3,000.00	9000
46	GATE VALVE	A1A		28"	MOV-750101	1	NOS.	21,000.00	21000
47	GATE VALVE	A1A		28"	MOV-750102	1	NOS.	21,000.00	21000
48	GATE VALVE	A1A		28"	MOV-750103	1	NOS.	21,000.00	21000
49	GATE VALVE	A1A		20"	MOV-1151	1	NOS.	15,000.00	15000
50	BALL VALVE FULL BORE	A1A		28"	MOV-1150	1	NOS.	21,000.00	21000
51	BALL VALVE FULL BORE	A1A		28"	MOV-113N	1	NOS.	21,000.00	21000
52	PLUG VALVE STANDARD BORE	A1A		16"	DBBV-750102	1	NOS.	8,000.00	8000
53	PLUG VALVE STANDARD BORE	A1A		28"	DBBV-750106	1	NOS.	21,000.00	21000

54	PLUG VALVE, STANDARD BORE	A1A		28"	DBBV-750107	1	NOS.	21,000.00	21000
55	PLUG VALVE, STANDARD BORE	A1A		28"	DBBV-750108	1	NOS.	21,000.00	21000
56	PLUG VALVE, STANDARD BORE	A1A		28"	DBBV-750109	1	NOS.	21,000.00	21000
57	PLUG VALVE, STANDARD BORE	A1A		30"	DBBV-750110	1	NOS.	22,500.00	22500
58	PLUG VALVE, STANDARD BORE	A1A		30"	DBBV-750113	1	NOS.	22,500.00	22500
59	PLUG VALVE, STANDARD BORE	A1A		16"	DBBV-1152	1	NOS.	8,000.00	8000
60	PLUG VALVE, STANDARD BORE	A1A		16"	DBBV-1153	1	NOS.	8,000.00	8000
61	PLUG VALVE, STANDARD BORE	A1A		16"	DBBV-1154	1	NOS.	8,000.00	8000
62	PLUG VALVE, STANDARD BORE	A1A		16"	DBBV-1155	1	NOS.	8,000.00	8000
<b>SUBTOTAL SP-02C</b>									<b>698,600.00</b>

Notes:

- 1 For detailed scope of work, refer SP-2F- Piping installation and scope of work mentioned in the tender
- 2 For SW valves 2" & below, separate erection charges will not be paid.

 <b>Mangalore Refinery and Petrochemicals Limited</b> (A subsidiary of Oil and Natural Gas Corporation Limited) 													
<b>Instructions to Bidders: Complete all the Highlighted Cells before submission</b> <b>FORM: SP-2D PIPING - ATTACHMENT -3 (SPECIALITY ITEM)</b>													
Tender No.:													
Tender Description: MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE													
Name of Bidder:													
<b>Lifting, Unloading and Transportation of items from trailers / trucks and moving the same to the site, storage, fabrication / erection / installation, Testing, hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built document, as per the bidding documents of all items mentioned here with</b>													
Sl. No.	Item	Piping Class	Commodity Code	Size (inc)	Line No.	P&id No.	Tag no.	Item Description	REMARKS	Qty	UOM	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
1	Y-Strainer	A1A		16"	16"-P-7500007-A1A	20005-GEN-P-PID-1061	SP-002	Y-Type Strainer, FLGD	For GA-75001	1	NOS.	38,000.00	38,000.00
2	Barred Tee	A1A		28"	28"-P-7500043-A1A	20005-GEN-P-PID-1062	SP-009	Barred Tee	For PL-75001	1	NOS.	21,000.00	21,000.00
3	Barred Tee	A1A		28"	28"-P-7500043-A1A	20005-GEN-P-PID-1062	SP-010	Barred Tee	For PL-75001	1	NOS.	21,000.00	21,000.00
4	Barred Tee	A1A		28"	28"-P-7500043-A1A	20005-GEN-P-PID-1062	SP-011	Barred Tee	For PL-75001	1	NOS.	21,000.00	21,000.00
5	Barred Tee	A1A		28"	28"-P-7500043-A1A	20005-GEN-P-PID-1062	SP-012	Barred Tee	For PL-75001	1	NOS.	21,000.00	21,000.00
6	Sampling System	A1A		3"	1"-P-7500047-A1A	20005-GEN-P-PID-1062	SP-750101	Sampling System		1	NOS.		
7	Y-Strainer	A1A		16"	16"-P-7500024-A1A	20005-GEN-P-PID-1064	SP-014	Y-Type Strainer, FLGD	For GA-75002	1	NOS.	38,000.00	38,000.00
8	T-Strainer	A1A		16"	16"-P-10-1101-A1A	20005-GEN-P-PID-1065	SP-019	T-Type Strainer, FLGD		1	NOS.	38,000.00	38,000.00
9	T-Strainer	A1A		16"	16"-P-10-1102-A1A	20005-GEN-P-PID-1065	SP-020	T-Type Strainer, FLGD		1	NOS.	38,000.00	38,000.00
10	Red. Barred Tee	A1A		28" X 20"	28"-P-10-1707-A1A	20005-GEN-P-PID-1065	SP-021	Reducing Barred Tee	For PR-1101	1	NOS.	21,000.00	21,000.00
<b>SUBTOTAL SP-02D</b>													
<b>257,000.00</b>													
<b>257,000.00</b>													

Notes:

1 For detailed scope of work, refer SP-2F- Piping Installation and scope of work mentioned in the tender



Mangalore Refinery and Petrochemicals Limited (A subsidiary of Oil and Natural Gas Corporation Limited)											
Instructions to Bidders: Complete all the Highlighted Cells before submission FORM: SP-2E PIPING - ATTACHMENT -4 (PIPING SUPPORT)											
Tender No: _____											
Tender Description: _____											
Name of Bidder: _____											
PIPING SUPPORTS (CONTRACTOR SUPPLIED)											
Supply, Lifting, Unloading and Transportation of Items from trailers / trucks and moving the same to the site, storage, fabrication, blasting, painting, erection / installation, Testing, hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built documents, as per the bidding documents of all items mentioned here with all accessories											
Sl. No.	Item	Support Item	Material	Length1 (in MM)/Steel Member	Length2/THK	ROD Dia (in MM) / Arc Length (MM)	Qty	UDM (Kg)	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)	
1	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
2	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
3	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
4	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
5	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
6	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
7	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
8	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
9	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
10	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
11	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
12	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
13	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
14	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
15	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
16	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
17	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
18	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
19	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
20	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
21	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
22	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
23	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
24	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
25	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
26	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
27	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
28	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
29	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
30	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
31	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
32	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
33	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
34	SLIDING ROD RD01-12-200	Rod	CARBON STEEL	200		12	1	0.18	121	31.49	
35	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
36	GUIDE FOR SHOE L63-6-3	Steel	A36	ISM 75		70	2	1.00	121	120.95	
37	LINE STOP SUPPORT FOR BARE CS PIPE L12-6-3	PAD	PTFE	70		70	2	0.77	750	576.98	
38	LINE STOP SUPPORT FOR BARE CS PIPE L12-6-3	PAD	PTFE	70		70	2	0.77	750	576.98	
39	SLIDING ROD RD01-12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
40	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
41	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40
42	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40
43	SLIDING ROD RD01-10-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
44	SLIDING ROD RD01-10-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
45	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40
46	SLIDING ROD RD01-10-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
47	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40
48	SLIDING ROD RD01-10-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
49	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40
50	SLIDING ROD RD01-10-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71	
51	SADDLE FOR BARE PIPE WP-330-12	WEAR PAD	ASTM A106 GR.B	350		10	339.336	1	9.32	60	559.40

52	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71	
53	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71	
54	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71	
55	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	AJTM A10S GR.8	350			10	339.396	1	9.32	60	559.40
56	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71	
57	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71	
58	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
59	SADDLE FOR BARE PIPE WP-400-16	WEAR PAD	AJTM A672 GR. B60 CL.12	400			10	425.217	1	13.35	60	801.11
60	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70	
61	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
62	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	Steel	A36	ISM 100	550		2	10.12	121	1,224.52		
63	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	PIB	PTFE	100			3	80	2	0.11	750	79.20
64	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70	
65	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
66	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	Steel	A36	ISM 100	550		2	10.12	121	1,224.52		
67	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	PIB	PTFE	100			3	80	2	0.11	750	79.20
68	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70	
69	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
70	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	Steel	A36	ISM 100	550		2	10.12	121	1,224.52		
71	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	PIB	PTFE	100			3	80	2	0.11	750	79.20
72	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70	
73	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
74	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	Steel	A36	ISM 100	550		2	10.12	121	1,224.52		
75	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	PIB	PTFE	100			3	80	2	0.11	750	79.20
76	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70	
77	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	15.08	121	1,824.44		
78	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	Steel	A36	ISM 100	550		2	10.12	121	1,224.52		
79	GLIDE SUPPORT FOR BARE CS PIPE LG2-28.3	PIB	PTFE	100			3	80	2	0.11	750	79.20
80	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
81	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
82	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
83	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
84	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
85	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
86	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
87	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
88	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
89	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
90	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
91	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
92	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
93	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
94	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
95	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
96	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
97	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
98	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			12	1	0.62	121	75.21	
99	PIPE SADDLE FOR CS BARE PIPE S6A-1-28.8	Steel	A36	ISA 100x75x8	380		2	8.19	121	990.41		
100	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
101	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
102	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
103	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
104	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
105	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
106	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
107	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
108	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
109	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
110	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
111	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
112	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
113	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
114	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
115	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
116	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
117	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
118	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
119	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
120	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
121	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
122	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	
123	PIPE SADDLE FOR CS BARE PIPE S6A-1-14.8	Steel	A36	ISA 75x75x8	280		2	4.98	121	603.06		
124	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98	







402	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	700			12	1	0.20	121	24.71	
403	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	175.962	1	4.14	60	248.62
404	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
405	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
406	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
407	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
408	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
409	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
410	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
411	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
412	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
413	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
414	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
415	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
416	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
417	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
418	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700				12	1	0.62	121	75.21
419	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
420	SLIDING ROD RODS 12-900	Rod	CARBON STEEL	900				12	1	0.80	121	96.70
421	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-B	Steel	A36	700	ISA 100K75#8			380	2	8.19	121	990.41
422	SLIDE SUPPORT FOR BARE CS PIPE LG2-28-B	Steel	A36	100	ISM 100			550	2	10.12	121	1,224.52
423	SLIDE SUPPORT FOR BARE CS PIPE LG2-28-B	ROD	PTFE	100				80	2	0.11	750	79.20
424	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230				12	1	0.20	121	24.71
425	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
426	SLIDING ROD RODS 12-310	Rod	CARBON STEEL	310				12	1	0.28	121	33.31
427	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
428	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230				12	1	0.20	121	24.71
429	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
430	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230				12	1	0.20	121	24.71
431	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
432	SLIDE SUPPORT FOR BARE CS PIPE LG2-B-3	Steel	A36	100	ISM 75			150	2	2.14	121	259.18
433	SLIDE SUPPORT FOR BARE CS PIPE LG2-B-3	ROD	PTFE	100				80	2	0.11	750	79.20
434	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.36	121	42.98
435	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
436	SLIDING ROD RODS 12-200	Rod	CARBON STEEL	200				12	1	0.20	121	24.71
437	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
438	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.36	121	42.98
439	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
440	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.44	121	53.72
441	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
442	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.36	121	42.98
443	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
444	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.44	121	53.72
445	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
446	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.36	121	42.98
447	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
448	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.44	121	53.72
449	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
450	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400				12	1	0.36	121	42.98
451	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-B	Steel	A36	400	ISA 75#75#8			280	2	4.98	121	603.06
452	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230				12	1	0.20	121	24.71
453	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11
454	SLIDING ROD RODS 12-310	Rod	CARBON STEEL	310				12	1	0.28	121	33.31
455	SADDLE FOR BARE PIPE WP-350-B	WEAR PAD	ASTM A106 GR.B	350			10	229.366	1	6.30	60	378.11





555	GLIDE SUPPORT FOR BARE CS PIPE LG2-14-3	PAD	PTFE	140		3	100	2	0.18	750	138.60
556	GLIDE SUPPORT FOR BARE CS PIPE LG2-14-3	Sheet	ASB	6MCM75			252	2	3.60	121	435.43
557	GLIDE SUPPORT FOR BARE CS PIPE LG2-14-3	PAD	PTFE	140		3	100	2	0.18	750	138.60
558	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98
559	PIPE SADDLE FOR CS BARE PIPE SSA-1-14-8	Sheet	A36	ISA 75x75x8			280	2	4.98	121	603.06
560	SLIDING ROD RDG12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71
561	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
562	SLIDING ROD RDG12-900	Rod	CARBON STEEL	900			12	1	0.80	121	96.70
563	PIPE SADDLE FOR CS BARE PIPE SSA-1-28-8	Sheet	A36	ISA 100x75x8			380	2	8.19	121	990.41
564	GLIDE SUPPORT FOR BARE CS PIPE LG2-28-3	Sheet	A36	6MCM100			350	2	10.12	121	1,224.52
565	GLIDE SUPPORT FOR BARE CS PIPE LG2-28-3	PAD	PTFE	140		3	100	2	0.18	750	138.60
566	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98
567	PIPE SADDLE FOR CS BARE PIPE SSA-1-14-8	Sheet	A36	ISA 75x75x8			280	2	4.98	121	603.06
568	SLIDING ROD RDG12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71
569	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
570	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98
571	PIPE SADDLE FOR CS BARE PIPE SSA-1-14-8	Sheet	A36	ISA 75x75x8			280	2	4.98	121	603.06
572	SLIDING ROD RDG12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71
573	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
574	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98
575	PIPE SADDLE FOR CS BARE PIPE SSA-1-14-8	Sheet	A36	ISA 75x75x8			280	2	4.98	121	603.06
576	SLIDING ROD RDG12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71
577	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
578	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98
579	PIPE SADDLE FOR CS BARE PIPE SSA-1-14-8	Sheet	A36	ISA 75x75x8			280	2	4.98	121	603.06
580	SLIDING ROD RDG12-230	Rod	CARBON STEEL	230			12	1	0.20	121	24.71
581	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		10	175.952	1	4.56	60	273.48
582	SLIDING ROD RDG12-400	Rod	CARBON STEEL	400			12	1	0.36	121	42.98







836	LUDING ROD HDDL 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
837	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 7507548		280	2	4.98	121	603.06
838	LUDING ROD HDDL 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
839	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		339.336	1	9.32	60	559.40
840	LUDING ROD HDDL 12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71
841	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		175.952	1	4.56	60	273.48
842	LUDING ROD HDDL 12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71
843	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		175.952	1	4.56	60	273.48
844	LUDING ROD HDDL 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
845	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 7507548		280	2	4.98	121	603.06
846	LUDING ROD HDDL 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
847	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		339.336	1	9.32	60	559.40
848	LUDING ROD HDDL 12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71
849	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		175.952	1	4.56	60	273.48
850	LUDING ROD HDDL 12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71
851	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330		175.952	1	4.56	60	273.48
852	LUDING ROD HDDL 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
853	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 7507548		280	2	4.98	121	603.06
854	LUDING ROD HDDL 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
855	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		339.336	1	9.32	60	559.40
856	LUDING ROD HDDL 12-230	Rod	CARBON STEEL	230		12	1	0.20	121	24.71



956	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
957	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
958	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
959	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
960	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
961	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
962	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
963	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
964	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
965	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
966	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
967	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
968	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
969	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
970	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
971	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
972	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
973	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
974	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
975	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
976	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
977	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
978	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
979	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
980	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
981	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
982	LUDING ROD RD0L 12-350	Rod	CARBON STEEL	350		12	1	0.31	121	37.60
983	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350		10	1	9.32	60	559.40
984	LUDING ROD RD0L 12-400	Rod	CARBON STEEL	400		12	1	0.36	121	42.98
985	PIPE SADDLE FOR CS BARE PIPE 56A-1-16-R	Sheet	ASIS	ISA 75075x8		280	2	4.98	121	603.06
986	LUDING ROD RD0L 12-260	Rod	CARBON STEEL	260		12	1	0.23	121	27.93
987	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350		10	1	7.86	60	471.34
988	LUDING ROD RD0L 12-265	Rod	CARBON STEEL	265		12	1	0.24	121	28.47



890	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350	285.923	1	7.86	60	471.34
890	SLIDING ROD RODS 12-365	Rod	CARBON STEEL	365	12	1	0.32	121	39.22
891	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350	285.923	1	7.86	60	471.34
892	GUIDE SUPPORT FOR BARE CS PIPE UG2-10-3	Steel	A36	5MC 75	200	2	2.86	121	345.58
893	GUIDE SUPPORT FOR BARE CS PIPE UG2-10-3	PSD	PTFE	100	80	2	0.11	750	79.20
894	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.23	121	27.93
895	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350	285.923	1	7.86	60	471.34
896	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230	12	1	0.20	121	24.71
897	SADDLE FOR BARE PIPE WP-350-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
898	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.30	121	24.71
899	SADDLE FOR BARE PIPE WP-350-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
1000	SLIDING ROD RODS 12-350	Rod	CARBON STEEL	350	12	1	0.31	121	37.60
1001	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	400	339.336	1	9.32	60	559.40
1002	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400	12	1	0.36	121	42.98
1003	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-8	Steel	A36	ISA 75x75x8	280	2	4.98	121	603.06
1004	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400	12	1	0.36	121	42.98
1005	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-8	Steel	A36	ISA 75x75x8	280	2	4.98	121	603.06
1006	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400	12	1	0.36	121	42.98
1007	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-8	Steel	A36	ISA 75x75x8	280	2	4.98	121	603.06
1008	SLIDING ROD RODS 12-350	Rod	CARBON STEEL	350	12	1	0.31	121	37.60
1009	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350	339.336	1	9.32	60	559.40
1010	SLIDING ROD RODS 12-200	Rod	CARBON STEEL	200	12	1	0.18	121	21.60
1011	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330	119.396	1	3.09	60	185.58
1012	SLIDING ROD RODS 12-156	Rod	CARBON STEEL	156	12	1	0.14	121	16.76
1013	SADDLE FOR BARE PIPE WP-300-4	WEAR PAD	ASTM A106 GR.B	300	119.396	1	2.81	60	168.57
1014	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230	12	1	0.20	121	24.71
1015	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330	119.396	1	3.09	60	185.58
1016	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.23	121	27.93
1017	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350	285.923	1	7.86	60	471.34
1018	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.23	121	27.93
1019	SADDLE FOR BARE PIPE WP-350-10	WEAR PAD	ASTM A106 GR.B	350	285.923	1	7.86	60	471.34
1020	GUIDE SUPPORT FOR BARE CS PIPE UG2-10-3	Steel	A36	5MC 75	200	2	2.86	121	345.58
1021	GUIDE SUPPORT FOR BARE CS PIPE UG2-10-3	PSD	PTFE	100	80	2	0.11	750	79.20
1022	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.20	121	24.71
1023	SADDLE FOR BARE PIPE WP-350-4	WEAR PAD	ASTM A106 GR.B	330	119.396	1	3.09	60	185.58
1024	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1025	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	450	2	9.69	121	1,172.85
1026	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1027	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	450	2	8.19	121	990.41
1028	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1029	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1030	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1031	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1032	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1033	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1034	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1035	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1036	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1037	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1038	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1039	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1040	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1041	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1042	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700	12	1	0.62	121	75.21
1043	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Steel	A36	ISA 100x75x8	380	2	8.19	121	990.41
1044	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230	12	1	0.20	121	24.71
1045	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
1046	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230	12	1	0.20	121	24.71
1047	SADDLE FOR BARE PIPE WP-350-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
1048	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260	12	1	0.30	121	24.71
1049	SADDLE FOR BARE PIPE WP-300-6	WEAR PAD	ASTM A106 GR.B	300	175.952	1	4.14	60	248.62
1050	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400	12	1	0.36	121	42.98
1051	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-8	Steel	A36	ISA 75x75x8	280	2	4.98	121	603.06
1052	SLIDING ROD RODS 12-200	Rod	CARBON STEEL	200	12	1	0.20	121	24.71
1053	SADDLE FOR BARE PIPE WP-330-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
1054	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400	12	1	0.36	121	42.98
1055	PIPE SADDLE FOR CS BARE PIPE S6A-1-14-8	Steel	A36	ISA 75x75x8	280	2	4.98	121	603.06
1056	SLIDING ROD RODS 12-200	Rod	CARBON STEEL	200	12	1	0.20	121	24.71
1057	SADDLE FOR BARE PIPE WP-350-6	WEAR PAD	ASTM A106 GR.B	330	175.952	1	4.56	60	273.48
1058	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1059	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1060	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1061	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1062	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1063	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1064	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1065	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1066	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1067	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1068	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1069	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1070	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1071	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1072	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1073	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1074	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1075	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1076	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1077	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1078	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1079	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1080	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1081	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20
1082	SADDLE FOR BARE PIPE WP-350-12	WEAR PAD	ASTM A106 GR.B	350	339.336	1	9.32	60	559.40
1083	SLIDING ROD RODS 10-230	Rod	CARBON STEEL	230	12	1	0.20	121	24.71
1084	GUIDE SUPPORT FOR BARE CS PIPE UG2-12-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1085	GUIDE SUPPORT FOR BARE CS PIPE UG2-12-3	PSD	PTFE	100	80	2	0.11	750	79.20
1086	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	Steel	A36	5MC 75	252	2	3.60	121	435.43
1087	GUIDE SUPPORT FOR BARE CS PIPE UG2-16-3	PSD	PTFE	100	80	2	0.11	750	79.20











1552	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1553	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1554	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1555	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1556	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1557	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1558	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1559	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1560	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1561	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1562	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1563	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1564	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140			100	2		0.18	750	138.60
1565	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1566	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1567	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1568	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1569	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1570	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1571	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1572	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1573	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1574	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1575	SLIDING ROD RODS 12-400	Rod	CARBON STEEL				400	12	1	0.36	121	42.98
1576	PIPE SADDLE FOR CS BARE PIPE 56A-1-14.8	Steel	A36	ISA 75x75x8			280	2		4.98	121	603.06
1577	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	Steel	A36	ISM 75			252	2		3.60	121	435.43
1578	SLIDE SUPPORT FOR BARE CS PIPE UG2-14.3	FRD	PTFE	140		3	100	2		0.18	750	138.60
1579	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1580	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1581	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				280	12	1	0.20	121	24.71
1582	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1583	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1584	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1585	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1586	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1587	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1588	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1589	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1590	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1591	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1592	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1593	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1594	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1595	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1596	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1597	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1598	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1599	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1600	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49
1601	SLIDING ROD RODS 12-230	Rod	CARBON STEEL				230	12	1	0.20	121	24.71
1602	SADDLE FOR BARE PIPE WP-280-B	WEAR PAD	ASTM A106 GR B			10	229.366	1		5.04	60	302.49















2166	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700					121	1	0.62	121	75.21
2167	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2168	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			121	1	0.62	121		75.21	
2169	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2170	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			121	1	0.62	121		75.21	
2171	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2172	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2173	SADDLE FOR BARE PIPE WP-330-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	7.86	60		471.34	
2174	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2175	SADDLE FOR BARE PIPE WP-330-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	7.86	60		471.34	
2176	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2177	SADDLE FOR BARE PIPE WP-330-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	6.96	60		417.47	
2178	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2179	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2180	SLIDING ROD RODS 12-500	Rod	CARBON STEEL	500			121	1	0.44	121		53.72	
2181	PIPE SADDLE FOR CS BARE PIPE S6A-1-20-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2182	GUIDE FOR SHOE L63-20-3	Sheet	A36	ISMIC 100			400	2	7.36	121		890.56	
2183	SLIDING ROD RODS 12-500	Rod	CARBON STEEL	500			121	1	0.44	121		53.72	
2184	PIPE SADDLE FOR CS BARE PIPE S6A-1-20-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2185	SLIDING ROD RODS 12-500	Rod	CARBON STEEL	500			121	1	0.44	121		53.72	
2186	PIPE SADDLE FOR CS BARE PIPE S6A-1-20-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2187	SLIDING ROD RODS 12-500	Rod	CARBON STEEL	500			121	1	0.44	121		53.72	
2188	PIPE SADDLE FOR CS BARE PIPE S6A-1-20-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2189	SLIDING ROD RODS 12-500	Rod	CARBON STEEL	500			121	1	0.44	121		53.72	
2190	PIPE SADDLE FOR CS BARE PIPE S6A-1-20-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2191	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2192	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2193	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2194	PIPE SADDLE FOR BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2195	GUIDE FOR SHOE L63-16-3	Sheet	A36	ISMIC 75			250	2	3.60	121		426.43	
2196	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2197	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2198	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2199	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2200	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2201	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2202	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2203	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2204	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2205	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2206	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2207	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2208	SADDLE FOR BARE PIPE WP-280-4	WEAR PAD	ASTM A106 GR.B	280			119.396	1	2.62	60		157.46	
2209	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2210	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2211	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2212	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2213	GUIDE FOR SHOE L63-4-3	Sheet	A36	ISMIC 75			70	2	1.00	121		120.95	
2214	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2215	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2216	GUIDE FOR SHOE L63-4-3	Sheet	A36	ISMIC 75			70	2	1.00	121		120.95	
2217	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2218	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2219	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2220	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2221	GUIDE FOR SHOE L63-4-3	Sheet	A36	ISMIC 75			70	2	1.00	121		120.95	
2222	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2223	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2224	SADDLE FOR BARE PIPE WP-280-4	WEAR PAD	ASTM A106 GR.B	280			119.396	1	2.62	60		157.46	
2225	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2226	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2227	SLIDING ROD RODS 4-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2228	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2229	SADDLE FOR BARE PIPE WP-330-2	WEAR PAD	ASTM A106 GR.B	330			62.84	1	1.63	60		97.67	
2230	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			121	1	0.62	121		75.21	
2231	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2232	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			121	1	0.62	121		75.21	
2233	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2234	SLIDING ROD RODS 12-700	Rod	CARBON STEEL	700			121	1	0.62	121		75.21	
2235	PIPE SADDLE FOR CS BARE PIPE S6A-1-28-8	Sheet	A36	ISA 100K75#8			380	2	8.19	121		990.41	
2236	GUIDE SUPPORT FOR BARE CS PIPE L62-28-3	Sheet	A36	ISMIC 100			550	2	10.12	121		1,224.52	
2237	GUIDE SUPPORT FOR BARE CS PIPE L62-28-3	Rod	PTFE	400			80	2	0.11	750		79.20	
2238	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2239	SADDLE FOR BARE PIPE WP-330-2	WEAR PAD	ASTM A106 GR.B	330			62.84	1	1.63	60		97.67	
2240	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2241	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2242	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2243	PIPE SADDLE FOR CS BARE PIPE S6A-1-16-8	Sheet	A36	ISA 75#75#8			280	2	4.98	121		603.06	
2244	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2245	SADDLE FOR BARE PIPE WP-480-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	6.96	60		417.47	
2246	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2247	SADDLE FOR BARE PIPE WP-310-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	6.96	60		417.47	
2248	GUIDE SUPPORT FOR BARE CS PIPE L62-10-3	Sheet	A36	ISMIC 75			200	2	2.86	121		345.58	
2249	GUIDE SUPPORT FOR BARE CS PIPE L62-10-3	Rod	PTFE	400			80	2	0.11	750		79.20	
2250	SLIDING ROD RODS 12-260	Rod	CARBON STEEL	260			121	1	0.23	121		27.93	
2251	SADDLE FOR BARE PIPE WP-310-10	WEAR PAD	ASTM A106 GR.B	310			285.923	1	6.96	60		417.47	
2252	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2253	SADDLE FOR BARE PIPE WP-380-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2254	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2255	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2256	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2257	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2258	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2259	SADDLE FOR BARE PIPE WP-330-4	WEAR PAD	ASTM A106 GR.B	330			119.396	1	3.09	60		185.58	
2260	SLIDING ROD RODS 12-230	Rod	CARBON STEEL	230			121	1	0.20	121		24.71	
2261	GUIDE SUPPORT FOR BARE CS PIPE L62-28-3	Sheet	A36	ISMIC 100			550	2	10.12	121		1,224.52	
2262	GUIDE SUPPORT FOR BARE CS PIPE L62-28-3	Rod	PTFE	400			80	2	0.11	750		79.20	
2263	SLIDING ROD RODS 12-400	Rod	CARBON STEEL	400			121	1	0.36	121		42.98	
2264	LINE STOP SUPPORT FOR BARE CS PIPE L32-14-23	Sheet	A36	ISMIC 75			70	2	1.00	121		120.95	















2801	LINE STOP FOR SHOE L3-6	Plate	CARBON STEEL	70	70	40	2	0.77	121	93.00
2802	LINE STOP FOR SHOE L3-6	SHD	PTFE	140	3	100	2	0.18	750	138.60
2803	GUIDE FOR SHOE L3-6-3	Steel	A36	ISM 75	70	70	2	1.00	121	120.95
2804	GUIDE FOR SHOE L3-6-3	Steel	A36	ISM 75	70	70	2	1.00	121	120.95
2805	T POST ST10A-200-200-85-917	Steel	A36	ISM 150	471.97	471.97	1	7.08	121	856.63
2806	T POST ST10A-200-200-85-917	Steel	A36	ISM 150	583	583	1	8.78	121	1,061.78
2807	T POST ST10A-200-200-85-917	Plate	S 2002	600	17	400	1	22.61		
2808	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2809	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2810	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2811	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2812	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2813	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2814	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2815	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2816	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2817	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2818	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2819	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2820	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2821	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2822	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2823	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2824	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2825	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2826	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2827	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2828	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2829	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2830	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2831	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2832	GDAL POST GP018-1000-500-500-500	Steel	A36	ISM 100	1220	1220	1	10.86	121	1,313.82
2833	GDAL POST GP018-1000-500-500-500	Steel	A36	ISM 100	400	400	1	3.56	121	430.76
2834	GDAL POST GP018-1000-500-500-500	Steel	A36	ISM 100	400	400	1	3.56	121	430.76
2835	GDAL POST GP018-1000-500-500-500	Plate	S 2002	600	12	400	2	45.12		
2836	T POST ST10A-200-200-1207	Steel	A36	ISM 150	721.97	721.97	1	10.83	121	1,310.38
2837	T POST ST10A-200-200-1207	Steel	A36	ISM 150	400	400	1	6.00	121	726.00
2838	T POST ST10A-200-200-1207	Plate	S 2002	600	12	400	1	22.61		
2839	T POST ST10A-550-150-100-1161	Steel	A36	ISM 150	1010	1010	1	15.15	121	1,833.15
2840	T POST ST10A-550-150-100-1161	Steel	A36	ISM 150	800	800	1	12.00	121	1,452.00
2841	T POST ST10A-550-150-100-1161	Plate	S 2002	600	12	400	1	22.61		















3378	T POST FT04A - 250-250-1218	Plate	IS 2002	600	400	1	0.21		
3379	GOAL POST GP018 - 2200-2000-1066-1066	Steel	A36	ISM4 400	2620	1	189.69	121	22,952.25
3380	GOAL POST GP018 - 2200-2000-1066-1066	Steel	A36	ISM4 400	1166.08	1	84.42	121	10,215.33
3381	GOAL POST GP018 - 2200-2000-1066-1066	Steel	A36	ISM4 400	1166.08	1	84.42	121	10,215.33
3382	GOAL POST GP018 - 2200-2000-1066-1066	Plate	IS 2002	600	400	2	0.42		
3383	T POST FT04A - 250-350-600-1066	Steel	A36	ISM4 500	1144.38	1	101.35	121	12,263.32
3384	T POST FT04A - 250-350-600-1066	Steel	A36	ISM4 500	1200	1	104.28	121	12,617.88
3385	T POST FT04A - 250-350-600-1066	Plate	IS 2002	600	400	1	0.21		
3386	T POST FT04A - 150-150-100-1048	Steel	A36	ISM4 300	848	1	8.44	121	1,020.90
3387	T POST FT04A - 150-150-100-1048	Steel	A36	ISM4 300	400	1	3.56	121	430.76
3388	T POST FT04A - 150-150-100-1048	Plate	IS 2002	600	400	1	0.21		
3389	T POST FT04A - 500-500-1067	Steel	A36	ISM4 350	787	1	55.53	121	6,719.23
3390	T POST FT04A - 500-500-1067	Steel	A36	ISM4 350	1000	1	72.40	121	8,760.40
3391	T POST FT04A - 500-500-1067	Plate	IS 2002	600	400	1	0.21		
3392	T POST FT04A - 500-500-2134	Steel	A36	ISM4 350	1784.9	1	129.23	121	15,636.44
3393	T POST FT04A - 500-500-2134	Steel	A36	ISM4 350	1000	1	72.40	121	8,760.40
3394	T POST FT04A - 500-500-2134	Plate	IS 2002	600	400	1	0.21		
3395	T POST FT04A - 500-500-2134	Steel	A36	ISM4 350	1784.9	1	129.23	121	15,636.44
3396	T POST FT04A - 500-500-2134	Steel	A36	ISM4 350	1000	1	72.40	121	8,760.40
3397	T POST FT04A - 500-500-2134	Plate	IS 2002	600	400	1	0.21		
3398	T POST FT04A - 200-200-851	Steel	A36	ISM4 150	701	1	10.52	121	1,272.32
3399	T POST FT04A - 200-200-851	Steel	A36	ISM4 150	400	1	6.00	121	726.00
3400	T POST FT04A - 200-200-851	Plate	IS 2002	600	400	1	0.21		
3401	L FRAME ST058 - 125-851	Steel	A36	ISM4 150	900	1	13.50	121	1,633.50
3402	L FRAME ST058 - 125-851	Steel	A36	ISM4 150	701	1	10.52	121	1,272.32
3403	T POST FT04A - 200-200-1081	Steel	A36	ISM4 150	913.8	1	13.97	121	1,690.40
3404	T POST FT04A - 200-200-1081	Steel	A36	ISM4 150	400	1	6.00	121	726.00
3405	T POST FT04A - 200-200-1081	Plate	IS 2002	600	400	1	0.21		
3406	T POST FT04A - 300-300-400-1878	Steel	A36	ISM4 400	1678	1	121.49	121	14,699.95
3407	T POST FT04A - 300-300-400-1878	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3408	T POST FT04A - 300-300-400-1878	Plate	IS 2002	600	400	1	0.21		
3409	T POST FT04A - 300-300-400-1878	Steel	A36	ISM4 400	1678	1	121.49	121	14,699.95
3410	T POST FT04A - 300-300-400-1878	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3411	T POST FT04A - 300-300-400-1878	Plate	IS 2002	600	400	1	0.21		
3412	T POST FT04A - 250-250-610	Steel	A36	ISM4 150	668.32	1	10.02	121	1,213.00
3413	T POST FT04A - 250-250-610	Steel	A36	ISM4 150	500	1	7.50	121	907.50
3414	T POST FT04A - 250-250-610	Plate	IS 2002	600	400	1	0.21		
3415	T POST FT04A - 250-250-2210	Steel	A36	ISM4 150	1910	1	138.28	121	16,732.36
3416	T POST FT04A - 250-250-2210	Steel	A36	ISM4 150	500	1	36.20	121	4,380.20
3417	T POST FT04A - 250-250-2210	Plate	IS 2002	600	400	1	0.21		
3418	T POST FT04A - 250-250-3217	Steel	A36	ISM4 350	2917	1	214.09	121	25,904.50
3419	T POST FT04A - 250-250-3217	Steel	A36	ISM4 350	500	1	36.20	121	4,380.20
3420	T POST FT04A - 250-250-3217	Plate	IS 2002	600	400	1	0.21		
3421	T POST FT04A - 250-250-2210	Steel	A36	ISM4 150	1910	1	138.28	121	16,732.36
3422	T POST FT04A - 250-250-2210	Steel	A36	ISM4 150	500	1	36.20	121	4,380.20
3423	T POST FT04A - 250-250-2210	Plate	IS 2002	600	400	1	0.21		
3424	T POST FT04A - 250-160-450-807	Steel	A36	ISM4 350	600	1	62.56	121	7,616.45
3425	T POST FT04A - 250-160-450-807	Steel	A36	ISM4 350	900	1	93.33	121	11,292.93
3426	T POST FT04A - 250-160-450-807	Plate	IS 2002	600	400	1	0.21		
3427	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1679	1	121.56	121	14,708.71
3428	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3429	T POST FT04A - 300-300-400-1479	Plate	IS 2002	600	400	1	0.21		
3430	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1679	1	121.56	121	14,708.71
3431	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3432	T POST FT04A - 300-300-400-1479	Plate	IS 2002	600	400	1	0.21		
3433	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1679	1	121.56	121	14,708.71
3434	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3435	T POST FT04A - 300-300-400-1479	Plate	IS 2002	600	400	1	0.21		
3436	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1679	1	121.56	121	14,708.71
3437	T POST FT04A - 300-300-400-1479	Steel	A36	ISM4 400	1200	1	86.88	121	10,512.48
3438	T POST FT04A - 300-300-400-1479	Plate	IS 2002	600	400	1	0.21		
3439	T POST FT04A - 350-350-700-1066	Steel	A36	ISM4 400	866	1	62.70	121	7,586.51
3440	T POST FT04A - 350-350-700-1066	Steel	A36	ISM4 400	1400	1	101.36	121	12,264.56
3441	T POST FT04A - 350-350-700-1066	Plate	IS 2002	600	400	1	0.21		
3442	T POST FT04A - 350-350-700-1066	Steel	A36	ISM4 400	866	1	62.70	121	7,586.51
3443	T POST FT04A - 350-350-700-1066	Steel	A36	ISM4 400	1400	1	101.36	121	12,264.56
3444	T POST FT04A - 350-350-700-1066	Plate	IS 2002	600	400	1	0.21		
3445	T POST FT04A - 250-250-1626	Steel	A36	ISM4 450	1426	1	103.24	121	12,492.53
3446	T POST FT04A - 250-250-1626	Steel	A36	ISM4 450	500	1	36.20	121	4,380.20
3447	T POST FT04A - 250-250-1626	Plate	IS 2002	600	400	1	22.61		
3448	T POST FT04A - 250-150-100-2094	Steel	A36	ISM4 150	1944	1	29.16	121	3,528.36
3449	T POST FT04A - 250-150-100-2094	Steel	A36	ISM4 150	1200	1	25.50	121	3,085.50
3450	T POST FT04A - 250-150-100-2094	Plate	IS 2002	600	400	1	22.61		
3451	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2070	1	120.06	121	14,527.26
3452	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	866	1	50.23	121	6,077.59
3453	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.59
3454	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3455	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3456	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	866	1	50.23	121	6,077.59
3457	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.59
3458	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3459	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3460	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	866	1	50.23	121	6,077.59
3461	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.59
3462	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3463	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3464	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	865.999	1	50.23	121	6,077.58
3465	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.58
3466	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3467	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3468	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	865.999	1	50.23	121	6,077.58
3469	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.58
3470	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3471	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3472	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	865.999	1	50.23	121	6,077.58
3473	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	1200	1	50.23	121	6,077.58
3474	GOAL POST GP018 - 1800-1800-1066-1066	Plate	IS 2002	600	400	2	45.22		
3475	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	2210	1	128.76	121	15,579.96
3476	GOAL POST GP018 - 1800-1800-1066-1066	Steel	A36	ISM4 400	865.999	1	50.23	121	6,077.58







3675	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	1770	1	44.96	121	5,439.92
3676	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3677	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3678	GOAL POST GP018-1350-150-708-708	Plate	S 2002	600	400	2	45.22		
3679	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	1770	1	44.96	121	5,439.92
3680	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3681	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3682	GOAL POST GP018-1350-150-708-708	Plate	S 2002	600	400	2	45.22		
3683	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	1770	1	44.96	121	5,439.92
3684	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3685	GOAL POST GP018-1350-150-708-708	Steel	A36	ISM8 200	508.185	1	12.91	121	1,561.86
3686	GOAL POST GP018-1350-150-708-708	Plate	S 2002	600	400	2	45.22		
3687	T POST ST10A-250-250-729	Steel	A36	ISM8 200	500	1	12.56	121	1,567.43
3688	T POST ST10A-250-250-729	Steel	A36	ISM8 200	500	1	12.70	121	1,536.70
3689	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3690	T POST ST10A-250-250-729	Steel	A36	ISM8 350	428.7	1	22.29	121	2,697.38
3691	T POST ST10A-250-250-729	Steel	A36	ISM8 350	500	1	26.00	121	3,146.00
3692	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3693	T POST ST10A-250-250-729	Steel	A36	ISM8 350	428.7	1	22.29	121	2,697.38
3694	T POST ST10A-250-250-729	Steel	A36	ISM8 350	500	1	26.00	121	3,146.00
3695	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3696	T POST ST10A-250-250-729	Steel	A36	ISM8 350	428.7	1	22.29	121	2,697.38
3697	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3698	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3699	T POST ST10A-250-250-729	Steel	A36	ISM8 300	428.7	1	19.72	121	2,386.14
3700	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3701	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3702	T POST ST10A-250-250-729	Steel	A36	ISM8 300	428.7	1	19.72	121	2,386.14
3703	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3704	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3705	T POST ST10A-250-250-729	Steel	A36	ISM8 300	425.7	1	19.77	121	2,391.71
3706	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3707	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3708	T POST ST10A-250-250-729	Steel	A36	ISM8 300	428.7	1	19.72	121	2,386.14
3709	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3710	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3711	T POST ST10A-250-250-729	Steel	A36	ISM8 300	428.7	1	19.72	121	2,386.14
3712	T POST ST10A-250-250-729	Steel	A36	ISM8 300	500	1	23.00	121	2,783.00
3713	T POST ST10A-250-250-729	Plate	S 2002	600	400	1	22.61		
3714	T POST ST10A-450-450-930	Steel	A36	ISM8 300	630	1	28.98	121	3,506.58
3715	T POST ST10A-450-450-930	Steel	A36	ISM8 300	900	1	41.40	121	5,009.40
3716	T POST ST10A-450-450-930	Plate	S 2002	600	400	1	22.61		
3717	T POST ST10A-450-450-930	Steel	A36	ISM8 300	630	1	28.98	121	3,506.58
3718	T POST ST10A-450-450-930	Steel	A36	ISM8 300	900	1	41.40	121	5,009.40
3719	T POST ST10A-450-450-930	Plate	S 2002	600	400	1	22.61		
3720	T POST ST10A-450-450-930	Steel	A36	ISM8 300	630	1	28.98	121	3,506.58
3721	T POST ST10A-450-450-930	Steel	A36	ISM8 300	1236.1	1	56.41	121	6,825.03
3722	T POST ST10A-450-450-930	Plate	S 2002	600	400	1	22.61		
3723	T POST ST10A-150-150-1078	Steel	A36	ISM8 100	137.3	1	1.22	121	148.07
3724	T POST ST10A-150-150-1078	Steel	A36	ISM8 100	300	1	2.67	121	323.07
3725	T POST ST10A-150-150-1078	Plate	S 2002	600	400	1	22.61		
3726	T POST ST10A-250-250-732	Steel	A36	ISM8 200	552	1	14.02	121	1,696.52
3727	T POST ST10A-250-250-732	Steel	A36	ISM8 200	500	1	12.70	121	1,536.70
3728	T POST ST10A-250-250-732	Plate	S 2002	600	400	1	22.61		
3729	T POST ST10A-250-250-732	Steel	A36	ISM8 100	120	1	14.02	121	1,696.52
3730	T POST ST10A-250-250-732	Steel	A36	ISM8 200	500	1	12.70	121	1,536.70
3731	T POST ST10A-250-250-732	Plate	S 2002	600	400	1	22.61		
3732	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1620	1	74.52	121	9,016.92
3733	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	438.7	1	20.18	121	2,441.80
3734	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	438.7	1	20.18	121	2,441.80
3735	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3736	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1620	1	74.52	121	9,016.92
3737	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	438.7	1	20.18	121	2,441.80
3738	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	438.7	1	20.18	121	2,441.80
3739	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3740	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 50x50x6.0	1120	1	5.01	121	605.77
3741	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 50x50x6.0	480	1	2.19	121	265.03
3742	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 50x50x6.0	480	1	2.19	121	265.03
3743	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3744	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 75x75x8.0	1170	1	10.41	121	1,259.97
3745	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 75x75x8.0	480	1	4.36	121	527.68
3746	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 75x75x8.0	480	1	4.36	121	527.68
3747	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3748	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1220	1	10.86	121	1,313.82
3749	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3750	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3751	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3752	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 200	1420	1	36.07	121	4,364.23
3753	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 200	300	1	7.62	121	922.02
3754	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1200	1	7.62	121	922.02
3755	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3756	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1220	1	10.86	121	1,313.82
3757	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3758	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3759	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3760	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1220	1	10.86	121	1,313.82
3761	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3762	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3763	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3764	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1220	1	10.86	121	1,313.82
3765	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3766	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3767	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3768	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	1220	1	10.86	121	1,313.82
3769	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3770	GOAL POST GP018-1000-500-500-500	Steel	A36	ISM8 100	400	1	3.56	121	430.76
3771	GOAL POST GP018-1000-500-500-500	Plate	S 2002	600	400	2	45.22		
3772	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 50x50x6.0	1120	1	5.01	121	605.77
3773	GOAL POST GP018-1000-500-500-500	Steel	A36	ISA 50x50x6.0	480	1	2.19	121	265.03

3774	GDAL POST GP018 - 1000-500-500-500	Steel	A36		6A S20x6x0	400	1	2.19	121	265.03
3775	GDAL POST GP018 - 1000-500-500-500	Plate	SS 20x2	600		400	2	45.22		
3776	T POST ST10A - 150-150-811	Steel	A36	200	ISM 200	911	1	23.14	121	2,799.87
3777	T POST ST10A - 150-150-811	Steel	A36	200	ISM 200	300	1	7.62	121	922.02
3778	T POST ST10A - 150-150-811	Plate	SS 20x2	600		400	1	22.61		
3779	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	806	1	12.09	121	1,462.89
3780	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	300	1	4.50	121	544.50
3781	T POST ST10A - 150-150-956	Plate	SS 20x2	600		400	1	22.61		
3782	T POST ST10A - 250-300-650-952	Steel	A36	200	ISM 200	752	1	19.10	121	2,311.20
3783	T POST ST10A - 250-300-650-952	Steel	A36	200	ISM 200	1200	1	30.48	121	3,688.08
3784	T POST ST10A - 250-300-650-952	Plate	SS 20x2	600		400	1	22.61		
3785	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	806	1	12.09	121	1,462.89
3786	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	300	1	4.50	121	544.50
3787	T POST ST10A - 150-150-956	Plate	SS 20x2	600		400	1	22.61		
3788	T POST ST10A - 200-200-952	Steel	A36	200	ISM 150	802	1	12.03	121	1,455.63
3789	T POST ST10A - 200-200-952	Steel	A36	200	ISM 150	600	1	9.00	121	1,089.00
3790	T POST ST10A - 200-200-952	Plate	SS 20x2	600		400	1	22.61		
3791	T POST ST10A - 200-200-952	Steel	A36	200	ISM 150	802	1	12.03	121	1,455.63
3792	T POST ST10A - 200-200-952	Steel	A36	200	ISM 150	400	1	6.00	121	726.00
3793	T POST ST10A - 200-200-952	Plate	SS 20x2	600		400	1	22.61		
3794	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	806	1	12.09	121	1,462.89
3795	T POST ST10A - 150-150-956	Steel	A36	200	ISM 150	300	1	4.50	121	544.50
3796	T POST ST10A - 150-150-956	Plate	SS 20x2	600		400	1	22.61		
3797	T POST ST10A - 250-250-935	Steel	A36	200	ISM 200	734.3	1	18.66	121	2,257.41
3798	T POST ST10A - 250-250-935	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3799	T POST ST10A - 250-250-935	Plate	SS 20x2	600		400	1	22.61		
3800	Special Support	Steel	A36	200	ISM 200	2185.7	1	55.52	121	6,717.53
3801	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3802	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3803	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3804	Special Support	Steel	A36	200	ISM 200	2185.7	1	55.50	121	6,715.38
3805	Special Support	Steel	A36	200	ISM 200	1250	1	31.75	121	3,841.75
3806	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3807	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3808	Special Support	Steel	A36	200	ISM 200	2185.7	1	55.50	121	6,715.38
3809	Special Support	Steel	A36	200	ISM 200	1250	1	31.75	121	3,841.75
3810	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3811	Special Support	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3812	T POST ST10A - 330-330-927	Steel	A36	200	ISM 300	626.93	1	28.82	121	3,487.27
3813	T POST ST10A - 330-330-927	Steel	A36	200	ISM 300	660	1	30.36	121	3,673.56
3814	T POST ST10A - 330-330-927	Plate	SS 20x2	600		400	1	22.61		
3815	T POST ST10A - 250-250-484	Steel	A36	200	ISM 100	384	1	3.42	121	413.53
3816	T POST ST10A - 250-250-484	Steel	A36	200	ISM 100	700	1	6.68	121	807.68
3817	T POST ST10A - 250-250-484	Plate	SS 20x2	600		400	1	22.61		
3818	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	390	1	3.47	121	419.99
3819	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3820	T POST ST10A - 250-250-500	Plate	SS 20x2	600		400	1	22.61		
3821	T POST ST10A - 250-250-500	Steel	A36	200	ISM 100	400	1	3.56	121	430.76
3822	T POST ST10A - 250-250-500	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3823	T POST ST10A - 250-250-500	Plate	SS 20x2	600		400	1	22.61		
3824	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	390	1	3.47	121	419.99
3825	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3826	T POST ST10A - 250-250-490	Plate	SS 20x2	600		400	1	22.61		
3827	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	390	1	3.47	121	419.99
3828	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3829	T POST ST10A - 250-250-490	Plate	SS 20x2	600		400	1	22.61		
3830	T POST ST10A - 100-100-500	Steel	A36	200	6A S10x0x6.0	490	1	2.19	121	265.03
3831	T POST ST10A - 100-100-500	Steel	A36	200	10A S10x0x6.0	200	1	0.89	121	108.17
3832	T POST ST10A - 100-100-500	Plate	SS 20x2	600		400	1	22.61		
3833	T POST ST10A - 100-100-500	Steel	A36	200	6A S10x0x6.0	490	1	2.19	121	265.03
3834	T POST ST10A - 100-100-500	Steel	A36	200	10A S10x0x6.0	200	1	0.89	121	108.17
3835	T POST ST10A - 100-100-500	Plate	SS 20x2	600		400	1	22.61		
3836	T POST ST10A - 250-250-500	Steel	A36	200	6A S10x0x6.0	490	1	2.19	121	265.03
3837	T POST ST10A - 250-250-500	Steel	A36	200	10A S10x0x6.0	200	1	2.24	121	270.44
3838	T POST ST10A - 250-250-500	Plate	SS 20x2	600		400	1	22.61		
3839	T POST ST10A - 250-250-480	Steel	A36	200	ISM 100	380	1	3.38	121	409.22
3840	T POST ST10A - 250-250-480	Steel	A36	200	ISM 100	500	1	4.45	121	538.45
3841	T POST ST10A - 250-250-480	Plate	SS 20x2	600		400	1	22.61		
3842	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	390	1	3.47	121	419.99
3843	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	500	1	4.45	121	538.45
3844	T POST ST10A - 250-250-490	Plate	SS 20x2	600		400	1	22.61		
3845	T POST ST10A - 250-250-480	Steel	A36	200	ISM 100	380	1	3.38	121	409.22
3846	T POST ST10A - 250-250-480	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3847	T POST ST10A - 250-250-480	Plate	SS 20x2	600		400	1	22.61		
3848	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	390	1	3.47	121	419.99
3849	T POST ST10A - 250-250-490	Steel	A36	200	ISM 100	750	1	6.68	121	807.68
3850	T POST ST10A - 250-250-480	Plate	SS 20x2	600		400	1	22.61		
3851	T POST ST10A - 250-250-608	Steel	A36	200	ISM 200	408	1	10.36	121	1,253.95
3852	T POST ST10A - 250-250-608	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3853	T POST ST10A - 250-250-608	Plate	SS 20x2	600		400	1	22.61		
3854	T POST ST10A - 250-250-608	Steel	A36	200	ISM 200	408	1	10.36	121	1,253.95
3855	T POST ST10A - 250-250-608	Steel	A36	200	ISM 200	500	1	12.70	121	1,536.70
3856	T POST ST10A - 250-250-608	Plate	SS 20x2	600		400	1	22.61		
3857	Special Support	Steel	A36	200	ISM 200	1253	1	31.83	121	3,850.97
3858	Special Support	Steel	A36	200	ISM 200	624	1	15.85	121	1,917.80
3859	Special Support	Steel	A36	200	ISM 200	650	1	16.51	121	1,997.71
3860	Special Support	Steel	A36	200	ISM 200	650	1	16.51	121	1,997.71
3861	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	280	1	7.11	121	860.55
3862	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	900	1	22.86	121	2,766.06
3863	T POST ST10A - 150-300-450-480	Plate	SS 20x2	600		400	1	22.61		
3864	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	280	1	7.11	121	860.55
3865	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	900	1	22.86	121	2,766.06
3866	T POST ST10A - 150-300-450-480	Plate	SS 20x2	600		400	1	22.61		
3867	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	280	1	7.11	121	860.55
3868	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	900	1	22.86	121	2,766.06
3869	T POST ST10A - 150-300-450-480	Plate	SS 20x2	600		400	1	22.61		
3870	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	280	1	7.11	121	860.55
3871	T POST ST10A - 150-300-450-480	Steel	A36	200	ISM 200	900	1	22.86	121	2,766.06
3872	T POST ST10A - 150-300-450-480	Plate	SS 20x2	600		400	1	22.61		

3873	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3874	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3875	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3876	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3877	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3878	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3879	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3880	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3881	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3882	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3883	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3884	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3885	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3886	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3887	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3888	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3889	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3890	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3891	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3892	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3893	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3894	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3895	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3896	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3897	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3898	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3899	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3900	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	280	1	7.11	121	860.55
3901	T POST STD-A-150-300-450-480	Steel	A36	ISM 200	900	1	22.86	121	2,766.06
3902	T POST STD-A-150-300-450-480	Plate	S 2002	600	400	1	22.61		
3903	T POST STD-A-250-350-378	Steel	A36	ISM 150	238	1	3.42	121	413.82
3904	T POST STD-A-250-350-378	Steel	A36	ISM 150	500	1	7.50	121	907.50
3905	T POST STD-A-250-350-378	Plate	S 2002	600	400	1	22.61		
3906	L FRAME STD-A-450-862	Steel	A36	ISM 150	1023	1	15.38	121	1,860.38
3907	L FRAME STD-A-450-862	Steel	A36	ISM 150	862	1	12.93	121	1,564.53
3908	L FRAME STD-A-450-862	Steel	A36	ISM 150	1023	1	15.38	121	1,860.38
3909	L FRAME STD-A-450-862	Steel	A36	ISM 150	862	1	12.93	121	1,564.53
3910	L FRAME STD-A-425-862	Steel	A36	ISM 150	1000	1	15.00	121	1,815.00
3911	L FRAME STD-A-425-862	Steel	A36	ISM 150	862	1	12.93	121	1,564.53
3912	L FRAME STD-A-425-862	Steel	A36	ISM 150	1000	1	15.00	121	1,815.00
3913	L FRAME STD-A-425-862	Steel	A36	ISM 150	862	1	12.93	121	1,564.53
3914	T POST STD-A-250-250-1817	Steel	A36	ISM 150	1643	1	24.68	121	2,985.68
3915	T POST STD-A-250-250-1817	Steel	A36	ISM 150	500	1	7.50	121	907.50
3916	T POST STD-A-250-250-1817	Plate	S 2002	600	400	1	22.61		
3917	T POST STD-A-250-250-1817	Steel	A36	ISM 150	1643	1	24.68	121	2,985.68
3918	T POST STD-A-250-250-1817	Steel	A36	ISM 150	500	1	7.50	121	907.50
3919	T POST STD-A-250-250-1817	Plate	S 2002	600	400	1	22.61		
3920	T POST STD-A-250-250-1817	Steel	A36	ISM 150	1643	1	24.68	121	2,985.68
3921	T POST STD-A-250-250-1817	Steel	A36	ISM 150	500	1	7.50	121	907.50
3922	T POST STD-A-250-250-1817	Plate	S 2002	600	400	1	22.61		
3923	T POST STD-A-250-250-608	Steel	A36	ISM 200	400	1	10.36	121	1,253.95
3924	T POST STD-A-250-250-608	Steel	A36	ISM 200	500	1	12.70	121	1,536.70
3925	T POST STD-A-250-250-608	Plate	S 2002	600	400	1	22.61		
3926	T POST STD-A-250-250-608	Steel	A36	ISM 200	400	1	10.36	121	1,253.95
3927	T POST STD-A-250-250-608	Steel	A36	ISM 200	500	1	12.70	121	1,536.70
3928	T POST STD-A-250-250-608	Plate	S 2002	600	400	1	22.61		
3929	T POST STD-A-250-300-650-952	Steel	A36	ISM 200	752	1	19.10	121	2,311.20
3930	T POST STD-A-250-300-650-952	Steel	A36	ISM 200	1700	1	30.48	121	3,688.08
3931	T POST STD-A-250-300-650-952	Plate	S 2002	600	400	1	22.61		
3932	T POST STD-A-300-300-937	Steel	A36	ISM 300	637	1	29.30	121	3,545.54
3933	T POST STD-A-300-300-937	Steel	A36	ISM 300	600	1	27.60	121	3,339.60
3934	T POST STD-A-300-300-937	Plate	S 2002	600	400	1	22.61		
3935	T POST STD-A-300-200-956	Steel	A36	ISM 200	756	1	19.20	121	2,323.49
3936	T POST STD-A-300-200-956	Steel	A36	ISM 200	400	1	10.16	121	1,229.36
3937	T POST STD-A-300-200-956	Plate	S 2002	600	400	1	22.61		
3938	T POST STD-A-150-150-956	Steel	A36	ISM 200	756	1	19.20	121	2,323.49
3939	T POST STD-A-150-150-956	Steel	A36	ISM 200	300	1	7.62	121	922.02
3940	T POST STD-A-150-150-956	Plate	S 2002	600	400	1	22.61		
3941	GUIDE SUPPORT UBL-1 (3)	J BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50
3942	GUIDE SUPPORT UBL-1 (3)	J BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50
3943	GUIDE SUPPORT UBL-0.75 (3)	J BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50
3944	WELD SUPPORT UBL-0.75	J BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50
3945	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3946	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3947	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3948	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3949	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3950	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3951	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3952	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3953	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3954	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3955	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3956	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3957	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3958	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3959	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3960	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3961	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3962	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3963	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3964	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3965	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3966	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3967	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3968	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3969	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3970	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24
3971	SADDLE FOR BARE PIPE WP-350-14	WEAR PAD	ASTM A106 GR. B	350	372	1	10.22	60	613.24











4396	WASHER FOR U-BOLT	U-BOLT				1					
4399	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4405	WASHER FOR U-BOLT	U-BOLT				1					
4408	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4414	WASHER FOR U-BOLT	U-BOLT				1					
4417	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4423	WASHER FOR U-BOLT	U-BOLT				1					
4426	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4432	WASHER FOR U-BOLT	U-BOLT				1					
4435	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4441	WASHER FOR U-BOLT	U-BOLT				1					
4444	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4450	WASHER FOR U-BOLT	U-BOLT				1					
4453	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4459	WASHER FOR U-BOLT	U-BOLT				1					
4462	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.50	121	60.50		
4468	WASHER FOR U-BOLT	U-BOLT				1					
4469	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4471	WASHER FOR U-BOLT	U-BOLT				1					
4472	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4474	WASHER FOR U-BOLT	U-BOLT				1					
4475	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4477	WASHER FOR U-BOLT	U-BOLT				1					
4478	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4480	WASHER FOR U-BOLT	U-BOLT				1					
4481	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4483	WASHER FOR U-BOLT	U-BOLT				1					
4484	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4486	WASHER FOR U-BOLT	U-BOLT	F436			21					
4487	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4490	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4493	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4496	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4499	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4502	GLIDE SUPPORT UB1-1 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4505	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4508	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4511	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4514	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4517	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4520	FIXED SUPPORT UB2-1	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4523	GLIDE SUPPORT UB1-0.75 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4526	GLIDE SUPPORT UB1-0.75 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4529	GLIDE SUPPORT UB1-0.75 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4532	GLIDE SUPPORT UB1-0.75 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4535	GLIDE SUPPORT UB1-0.75 (3)	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4538	FIXED SUPPORT UB2-0.75	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		
4541	FIXED SUPPORT UB2-0.75	U-BOLT	A193 GR.87 / A194 GR.2H (HDG)			1	0.5	121	60.50		

4544	FRED SUPPORT UB3.0.75	J-BOLT	A193 GR 87 / A194 GR 2H (HDG)				1	0.5	121	60.50
SUB-TOTAL OF SP-3E										5,550,091.08

Notes:



- 1 For detailed scope of work, refer SP-2F- Piping Installation and scope of work mentioned in the tender
- 2 Pipe material required for supports will be free issued to construction contractor. All other support materials will be in construction contractor scope.

Mangalore Refinery and Petrochemicals Limited (A subsidiary of Oil and Natural Gas Corporation Limited)						
<b>Instructions to Bidders: Complete all the Highlighted Cells before submission</b>						
<b>FORM: SP-2F : PIPE, FITTINGS, FLANGES, GASKET, BOLTS AND NUTS (FREE ISSUE MATERIAL) - FREE ISSUE BY THE COMPANY</b>						
Tender No: -						
Tender Description: MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE						
Lifting, Unloading and transportation of items from trailers / trucks and moving the same to the site, storage, fabrication / erection / installation, Testing (including NDT & hydrotesting), hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built document, as per the bidding documents of all items mentioned here with						
Name of Bidder :						
				CHARGES FOR CONSTRUCTION, ERECTION, INSTALLATION & HANDLING		
Sl. No.	Material Code	Description	Qty	UOM	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
		<b>PIPING-UNITS</b>				
		<b>PIPING (ABOVE GROUND) :</b> Lifting, unloading and handling of all piping items from client warehouse to work site/ Yard. Piping fabrication & erection including cleaning, cutting, edge preparation, (inclusive of grinding the edges of pipe, fittings, flanges etc. to match with the mating edges of uneven/different thickness wherever required). Erection and Welding of hook-up (including cutting if required) providing isolation blinds on existing line on both sides of the hook-up, making the line hydrocarbon free for welding. Hook-up/Tie-in shall mean either Cold-Tapping (CT), Cold-Joint (CJ), Hot-Tapping (HT), Hot-Joint (HJ), as per the respective drawings. For Hot tapping, please refer SOW document attached. Edge preparation of both ends of joint of hook up, fit-up, (health check of existing corroded pipe wall thickness for fit-up with existing piping) bending, preheating wherever required. Welding, threading, and laying of pipes of all types and wall thickness with all types of supports, T post etc. and welding of stiffeners as per drawings, consumables, labor, and completing work as per drawings & specifications. Installation of Low friction Pads over racks and at all elevations in existing structure as per provided piping GAD, isometrics and support standards, connecting with existing / new equipment nozzles. Erection of inline valves, strainers, Barred Tee, line instruments/ valves, orifice assemblies, tapings for pressure gauges, thermowells, including impulse piping etc. as per drawings / PIDs including fixing of gaskets, bolts, nuts wherever required & all other fittings, flanges, Spectacle Blinds/ Spacer, elbows, reducers, tees, vents, drains (but including reinforcing pads) Construction & installation of rain caps at pipe ends as required, valves size up to 15 NB for hydrostatic drain & vent, alignment, cleaning & flushing by water/compressed air. Conducting Stress Relieving, Hydrostatic Testing, NDE, pneumatic testing, vacuum, and any other type of testing as specified. Draining, drying by compressed air. Scope is inclusive of draining of lines, bolt servicing, blinding, debinding, flushing, arrangement of blinds/spades (material by contractor), testing, issuing of formats, checklist liquidation, pre commissioning of lines like flushing, blowing, purging, draining (arrangement of hoses, flanges with fire hose adapter shall be arranged by contractor including material), final box up and commissioning of line, all other activities that are needed to complete the work to the satisfaction of Engineer in-charge / Operations. Scaffolding & heavy equipment (like Crane etc.) required for all the above activities shall be in bidder's scope. Completing all such works in all respects, arranging tools & tackles, fabrication, as required to carry out the above modification cum new piping fabrication & installation work as specified in Special Conditions of Contract, drawings and instructions of Engineer-in-Charge. Contractor to return the surplus free issue materials and scrap etc. considering wastage not exceeding 3% to owner's storage points after reconciliation. Contractor shall refer Isometric drawing for the Butt Weld details. Rates for tubing (if any) shall include rates for valves, fittings, all in line instruments and testing etc. <u>Note: Refer Annexure for detailed MTO.</u>				
		<b>INCH-DIA :</b>				
		CARBON STEEL PIPING : Refer Annexure for detailed MTO	29665	Inch Dia	900.00	26,698,500.00
		STAINLESS STEEL PIPING : Refer Annexure for detailed MTO	250	Inch Dia	1,500.00	375,000.00
		<b>INCH-METER :</b>				
		CARBON STEEL PIPING : Refer Annexure for detailed MTO	90000	Inch Meter	350.00	31,500,000.00
		STAINLESS STEEL PIPING : Refer Annexure for detailed MTO	100	Inch Meter	410.00	41,000.00
		<b>REMOVAL AND MODIFICATION OF ERECTED PIPING (ABOVE GROUND) :</b> Removal of piping (of various sizes) existing/ erected including SW valves for modification as required as per drawings/P&IDs/instructions of Engineer-in-charge at all elevations, including draining of lines, bolt servicing, blinding, debinding, flushing (arrangement of hoses, flanges with fire hose adapter shall be arranged by contractor including material), arrangement of blinds/spades (material by contractor), blinding with spades on either side/multiple sides of the line to be removed, unbolting of flanged joints/cutting of pipe lines wherever required, installation of flanges and blind flanges, removing supports, all fittings and flanges, instruments etc., cutting of pipes in appropriate length for transporting purposes, cleaning, flushing, drying and transporting all materials to storage point (within the complex battery limits) designated by Owner including stacking of material and disposing of waste etc. as instructed by Engineer-in-charge. Scaffolding required for all the above activities shall be in bidder's scope.	1000	Inch Meter	200.00	200000
		<b>REMOVAL, MODIFICATION AND REINSTALLATION OF VALVES (ABOVE GROUND) :</b> Removal of all types and ratings of valves (of various sizes) by unbolting, cutting etc. as required as per the Piping GAD. Isometrics and P&ID, at all elevations, including draining of lines, bolt servicing, blinding, debinding, flushing (arrangement of hoses, flanges with fire hose adapter shall be arranged by contractor including material), arrangement of blinds/spades (material by contractor), blinding with spades on either side/multiple sides of the valves to be removed, cleaning by flushing with water/air etc. as required and transportation of the same to Owner's storage point (within the complex battery limits) and wherever required to be reinstalled and stacking as per directions of Engineer-in-charge. Scaffolding required for all the above activities shall be in bidder's scope.	13	NOS.	8,000.00	104000
		<b>PIPING (UNDER GROUND) :</b> Coating & Wrapping on Under Ground pipe, as per specification provided in the tender.	227	SQ. Meters	4,500.00	1,021,500.00
		Sealing of CS pipe sleeves by "bitumen impregnated mineral wool" (thk. 0.025 m) wherever passing through road crossings.	0.04	CU. Meters	755,000.00	30,200.00
SUBTOTAL SP-02F					770,860.00	59,970,200.00

ONGC		Mangalore Refinery and Petrochemicals Limited (A subsidiary of Oil and Natural Gas Corporation Limited)		ONGC								
<b>Instructions to Bidders: Complete all the Highlighted Cells before submission</b>												
<b>FORM: SP-2D PIPING - ATTACHMENT -3 (SPECIALITY ITEM)</b>												
Tender No: -												
Tender Description : MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE												
Name of Bidder :												
Supply, Lifting, Unloading and Transportation of items from trailers / trucks and moving the same to the site, storage, fabrication / erection / installation, Testing, hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built document, as per the bidding documents of all items mentioned here with												
Sl. No.	Item	Piping Class	Commodity Code	Size (Inch)	Line No.	P&id No.	Tag no.	Item Description	Qty	UOM	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
1	Insulating Gasket	A1A/A1M		1"	1"-P-7500005-A1M	20005-GEN-P-PID-1061	SP-003	Insulating Gasket	1	NOS.	1,830.40	1,830.40
2	Insulating Gasket	A1A/A1M		1"	1"-P-7500082-A1A	20005-GEN-P-PID-1061	SP-004	Insulating Gasket	1	NOS.	1,830.40	1,830.40
3	Insulating Gasket	A1A/A1M		0.75"	0.75"-P-7500081-A1A	20005-GEN-P-PID-1061	SP-005	Insulating Gasket	1	NOS.	1,830.40	1,830.40
4	Insulating Gasket	A1A/A1M		1"	1"-P-7500014-A1M	20005-GEN-P-PID-1061	SP-006	Insulating Gasket	1	NOS.	1,830.40	1,830.40
5	Insulating Gasket	A1A/A1M		1"	1"-P-7500084-A1A	20005-GEN-P-PID-1061	SP-007	Insulating Gasket	1	NOS.	1,830.40	1,830.40
6	Insulating Gasket	A1A/A1M		0.75"	0.75"-P-7500083-A1A	20005-GEN-P-PID-1061	SP-008	Insulating Gasket	1	NOS.	1,830.40	1,830.40
7	Insulating Gasket	A1A/A1M		1"	1"-P-7500074-A1A	20005-GEN-P-PID-1064	SP-015	Insulating Gasket	1	NOS.	1,830.40	1,830.40
8	Insulating Gasket	A1A/A1M		0.75"	0.75"-P-7500075-A1A	20005-GEN-P-PID-1064	SP-016	Insulating Gasket	1	NOS.	1,830.40	1,830.40
9	Insulating Gasket	A1A/A1M		1"	1"-P-7500069-A1M	20005-GEN-P-PID-1064	SP-017	Insulating Gasket	1	NOS.	1,830.40	1,830.40
10	Insulating Gasket	A1A/A1M		1"	1"-P-7500069-A1M	20005-GEN-P-PID-1064	SP-019	Insulating Gasket	1	NOS.	1,830.40	1,830.40
11	Sight Glass	A1A		4"	4"-P-10-1157-A1A	20005-GEN-P-PID-1065	SP-022	Sight Glass	1	NOS.	2,100.00	2,100.00
12	Drifrice Plate							Drifrice Plate	1	NOS.	11,533.20	11,533.20
<b>Total Amount</b>											20,404.00	31,937.20

## Notes:

- For detailed scope of work, refer SP-2F- Piping Installation and scope of work mentioned in the tender

		<b>Mangalore Refinery and Petrochemicals Limited</b> (A subsidiary of Oil and Natural Gas Corporation Limited)					
<b>Instructions to Bidders: Complete all the Highlighted Cells before submission</b> <b>FORM: SP-4A - MECHANICAL - (ERECTION)</b>							
Tender No: _____							
Tender Description : CONSTRUCTION TENDER ON ITEM RATE BASIS FOR TANK MODIFICATIONS & ASSOCIATED WORKS INSIDE REFINERY PROJECT AT MRPL, MANGALURU, KARNATAKA							
Name of Bidder : _____							
Lifting, Unloading and Transportation of items from trailers / trucks and moving the same to the site, storage, fabrication / erection / installation, Testing, hook-up and tie-in, Mechanical completion, pre-commissioning, commissioning, start-up assistance and Hand over and As-Built document, as per the bidding documents of all items mentioned here with							
Sl. No.	Material Code	Description	Qty	UOM	Tonnes per item	Unit rate in INR (Excluding GST)	Amount in INR (Excluding GST)
1.0		<b>Pig Launcher (PL-75001) &amp; Pig Receiver (PR-1101) alongwith pig handling devices &amp; pig indicator &amp; transmitter - Free Issue Material</b>					
1.1		Erection/ Installation on foundation, anchoring, mechanical completion, pre-commissioning activities of Pig Launcher -1 No. (PL-75001) & Pig Receiver - 1 No. (PR-1101) alongwith pig handling devices, hinged closure and pig indicator & transmitter with all its accessories, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. In addition to above, Installation/ erection activities also includes verification of Equipment bolt holes with foundation bolts, installing equipment on foundation / supporting structure at various elevations, Leveling, aligning, dressing of foundation, providing necessary supports, issuing of formats, liquidation of checklist as per tender document requirement. Supply of all consumables, arrangements of sufficient number of labour, machineries, tools & tackles etc. Clean up of equipment after unpacking & before making it ready for erection, surface preparation and touch up painting of shop primer/paint as applicable, insulation works, cleaning/removal of debris & packing materials as per direction of engineer in charge, all required scaffolding, arrangement of testing of equipment, arrangement of crane of sufficient capacity, all materials required for temporary works like hydro testing, purging and installation, depositing left over material to owner store. lifting devices (lifting bar, spreader bar etc. as required), site inspection and documentation in compliance with all the project requirements.	1	Nos.	3	220,000.00	220,000.00
2.0		<b>Cartridge Filter (FD-75001) - Free Issue Material</b>					
2.1		Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Cartridge Filter complete with all its accessories and support base as applicable as per Specification, Datasheets & Manufacturing drawings. In addition to above, Installation/ erection, pre-commissioning activities also includes verification of equipment bolt holes with foundation bolts, installing equipment on foundation / supporting structure at various elevations, leveling, aligning, dressing of foundation, issuing of formats, liquidation of checklist, providing necessary supports, earthing protection by way of fixing strips as per tender document requirement. supply of all consumables, arrangements of sufficient number of labour, machineries, tools & tackles etc. Clean up of equipment after unpacking & before making it ready for erection, opening of flanges, covers and cleaning, box-up, surface preparation and touch up painting of shop primer/paint as applicable. Insulation works, cleaning/removal of debris & packing materials as per direction of engineer in charge, all required scaffolding, arrangement of testing of equipment, arrangement of crane of sufficient capacity, all materials required for temporary works like hydro testing, purging and installation, depositing left over material to store. lifting devices (lifting bar, spreader bar etc. as required), site inspection, site documentation in compliance with all the specifications, data sheets, national/International codes, standards and other documents enclosed/referenced in the Tender.	1	No.	1	110,000.00	110,000.00
3.0		<b>Centrifugal Pumps &amp; Motors - Free Issue Material</b>					
3.1		Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Centrifugal pumps alongwith motors and complete with all its accessories and support base, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. In addition to above, Installation/ erection, pre-commissioning activities also includes verification of equipment bolt holes with foundation bolts, installing equipment on foundation / supporting structure at various elevations, leveling, aligning, dressing of foundation, alignment of pump with piping and without piping, issuing of formats, liquidation of checklist, providing necessary supports, earthing protection by way of fixing strips as per tender document requirement. supply of all consumables, arrangements of sufficient number of labour, machineries, tools & tackles etc. Clean up of equipment after unpacking & before making it ready for erection, surface preparation and touch up painting of shop primer/paint as applicable, Insulation Works, cleaning/removal of debris & packing materials as per direction of engineer in charge, all required scaffolding, arrangement of testing of equipment, arrangement of crane of sufficient capacity, all materials required for temporary works like hydro testing, purging and installation, depositing left over material to store. lifting devices (lifting bar, spreader bar etc. as required), site inspection, site documentation in compliance with all the specifications, data sheets, national/International codes, standards and other documents enclosed/referenced in the Tender.					
3.1.1	GA-75001	PCA Circulation Pump	1	Nos.	2.3	80,000.00	80,000.00
3.1.2	GA-75002	PCK Circulation Pump	1	Nos.	2.3	80,000.00	80,000.00
4.0		<b>Dosing Packages - Free Issue Material</b>					
4.1		Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Dosing packages complete with all its accessories and support base, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. In addition to above, Installation/ erection, pre-commissioning activities also includes verification of equipment bolt holes with foundation bolts, assembly of loose supplied piping spools if any, installing equipment on foundation / supporting structure at various elevations, leveling, aligning, dressing of foundation, issuing of formats, liquidation of checklist, providing necessary supports, earthing protection by way of fixing strips as per tender document requirement. supply of all consumables, arrangements of sufficient number of labour, machineries, tools & tackles etc. Clean up of equipment after unpacking & before making it ready for erection, opening of flanges, covers and cleaning, box-up, surface preparation and touch up painting of shop primer/paint as applicable, insulation Works, cleaning/removal of debris & packing materials as per direction of engineer in charge, all required scaffolding, arrangement of testing of equipment, arrangement of crane of sufficient capacity, all materials required for temporary works like hydro testing, purging and installation, depositing left over material to store. lifting devices (lifting bar, spreader bar etc. as required), site inspection, site documentation in compliance with all the specifications, data sheets, national/International codes, standards and other documents enclosed/referenced in the Tender.					
4.1.1		Lubricty Dosing Package - (PA-75003) + STADIS - 450 Dosing Tank (FA-75001)	1	Nos.	1.5	120,000.00	120,000.00
4.1.2		Lubricty Dosing Package - (PA-75004)	1	Nos.	1.2	90,000.00	90,000.00
5.0		Installation of TSVs (Of various sizes)	12	Nos.		7,000.00	84,000.00
6.0		Installation of PSVs (Of various sizes)	4	Nos.		7,000.00	28,000.00
SURTOTAL: SPIL-4						714,000.00	817,000.00





Part – A	CONSTRUCTION SUPERVISION AND MANAGEMENT	Tender No :	3200000590
Section – A-1		Document No:	20005-GEN-G-DOC-9126
Subsection – A-1.1		Rev :	0

<b>A-1</b>	<b>REQUIREMENT DURING CONSTRUCTION</b>
<b>A-1.1</b>	<b>CONSTRUCTION SUPERVISION AND MANAGEMENT</b>

## MRPL Marketing Infrastructure Projects, Mangalore



**PROJECT :** Marketing Infrastructure Projects, MRPL

**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** Nauvata Engineering Pvt. Ltd.



**JOB NO. :** JBG20005

0	09-Mar-2021	Issued for Bid	JT	ASN	ASN
Rev. No.	Date	Description	Prepared By	Checked By	Approved By



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>		Page 528 of 1115		
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	Section – A-1		Document No:		20005-GEN-G-DOC-9126
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 <b>ONGC</b> एन ओ एन सी <b>MRPL</b>	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>			Page 530 of 1115	 <b>nauvata</b> ENGINEERING DEVELOPMENT
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	Subsection – A-1.1		Rev :		0

## 1 GENERAL CONTROL AND ADMINISTRATION

### 1.1 SCOPE OF CONSTRUCTION WORK

Contractor shall be totally responsible for all Work and services related to facilitate the Construction of the Project as described in the Project Specification.

During the execution of the Work at the Site, Contractor's activities will be monitored by MRPL/PMC and any other personnel appointed by MRPL/PMC.

### 1.2 CONSTRUCTION EXECUTION PLAN (CEP)

Bidders are required to produce, and submit in their technical proposal, an outline Construction Execution Plan (CEP). Contractor will provide a detailed CEP within one month of award of contract and submit to MRPL/PMC for review. In the event of the bidder being successful the structure and contents of this CEP shall be expanded further from this proposal in the development of the detailed CEP for the project execution.

This CEP shall also identify the key critical construction strategies and key issues that will require detailed risk assessment and constructability reviews.

### 1.3 LOCAL AUTHORITY REQUIREMENTS -REGISTRATION

Contractor and its Sub-contractors shall ensure that it is properly and fully registered with the appropriate and relevant Indian authorities and government organisations for the purpose of conducting the business of contracting of construction works in India.

### 1.4 PERMITS AND GOVERNMENT INSPECTION

Contractor shall apply for and arrange the necessary field inspections and tests by the Government Inspection Authorities.

### 1.5 VISAS AND WORK PERMITS

Contractor shall make all necessary arrangements in a timely manner, and be fully responsible for the necessary passports, Indian visas and work permits for any expatriates personnel to be employed by it, its Sub-contractors and Vendors Representatives.



Contractor shall ensure that MRPL/PMC and its agents shall be saved harmless from any actions arising associated with Contractors activities. Contractor shall demonstrate to MRPL/PMC its plans and procedures to ensure compliance with all government and MRPL requirements.

### 1.6 ORGANISATION

Contractor shall establish a Site management organization with adequate authority to be responsible for all Site activities up to Provisional Acceptance.

Contractor shall appoint a Construction Manager responsible, on behalf of Contractor, for all its Site activities. Either the Construction Manager or a nominated deputy, duly approved by MRPL, shall always be present on the Site during normal working hours. Contractor shall ensure that its representatives are in attendance during any working out of normal working hours.

As far as possible such organization shall be compatible with MRPL/PMC's site organization to facilitate communication and work arrangement as far as practicable.

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Contractor shall provide MRPL/PMC with a detailed Organogram of its complete proposed Site organization, including names, terms of reference for the various job functions and their respective reporting relationships. CVs of nominees for senior positions shall be submitted to MRPL/PMC for approval. Organogram shall be presented to show the organizations during the following stages of the works:-

- Detailed design and commencement of construction
- Peak construction activity
- Mechanical installation completion and pre-commissioning

Contractor shall ensure that the numbers of its skilled Construction Supervisory Personnel are adequate in numbers and capability/qualifications to ensure effective control and coordination of all construction operations of both its own and its Sub-contractors and that they are present on the Site at all times throughout the total duration of the Project.

MRPL/PMC reserves the right to instruct Contractor to increase the levels of its and/or its Sub-contractors Supervisory Personnel in the event that either the safety, quality, or progress of the Work warrant such action to be taken.

Contractor shall ensure its Site management team, including engineering personnel who are fully able to resolve all engineering questions arising at the Site, are available at all times during the construction period and up to Provisional Acceptance.

## 1.7 PERSONNEL

Contractor shall provide all necessary management personnel, labour, Vendor specialists and Sub-contractors in adequate numbers in order to execute the Work in accordance with the Contract.

Contractor's and its Sub-contractor's personnel, both technical and direct labour, shall have all the required technical skills and qualifications required for the performance of the work to which they are assigned and shall have in their possession all licenses and certificates needed to substantiate this. MRPL/PMC reserves the right to conduct technical interviews with all personnel presented to MRPL for their acceptance.

## 1.8 PERSONNEL REGISTRATION



Once Contractor's personnel and its Sub-contractor's key personnel have been accepted by MRPL/PMC, they shall not be changed or promoted to more senior positions unless alternative persons, accepted by MRPL/PMC, are made immediately available at Site.

Contractors and Sub-contractor's supervisory staff and Vendor Representatives shall be fully conversant with the English language, both written and spoken.

Contractor shall ensure that all expatriate person(s) to be employed on the Site are registered for work in India

Contractor and its Sub-contractors shall maintain full personnel records on all persons employed on the Site.

Contractor shall issue a Daily Workforce Reports to MRPL/PMC before noon on following day. The breakdown shall be by Contractor and individual Sub- contractor, and be further divided by job position and trade.

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Contractor shall inform MRPL/PMC daily of the number of men scheduled to work overtime (divided as above) and the expected duration of the scheduled overtime. Contractor shall inform MRPL/PMC of their proposal to work any hours outside those of daylight and identify safety and supervisory personnel required to control such work. Contractor shall also identify any requirements for MRPL/PMC personnel to support and inspect such work.

## 1.9 RECRUITMENT AND TRAINING

Contractor shall maximize the use of local Indian construction labour before utilizing labour from other sources.

Contractor shall use a suitable screening method in the recruitment of all labour in order to ensure that personnel are in good health and of proper technical and skilled ability. Contractor shall keep full records of all persons screened for MRPL/PMC inspection.

Contractor shall ensure that, as a minimum, the Terms and Conditions of Employment of all persons are in full accordance with Indian Labour Law requirements.

Contractor shall ensure that it, and its Subcontractors or Partners, complies fully with Indian immigration laws for any approved foreign labour or supervision.

## 1.10 TRAINING

Contractor shall ensure that an adequate skill-training scheme is established in order to make maximum use of the local labour. Contractor shall maintain their training scheme records and shall be submitted to MRPL/PMC upon request.

Contractor shall ensure that the requirements for the safety induction and training of labour are carried out in accordance with the Safety Management System, during Construction and up to Provisional Acceptance.

Contractor shall ensure that all its, and its Sub-contractors, supervisory and direct labour to be engaged in work within existing operational facilities (e.g. piping tie-ins, civil foundations, cable laying, equipment installation) satisfy the MRPL/PMC operations procedure, permitting and safety induction requirements to do such work.

## 1.11 PERSONNEL RELATIONS



Contractor shall ensure that it and all its Sub-contractors and Vendors' Representatives maintain harmonious Labour Relations whilst on the Site. There shall also be a strict observance of a mutual understanding, between employers, that persons, still employed by one company, will not be offered employment by another company.

Contractor shall maintain close liaison with MRPL/PMC with regard to all issues, which could affect the maintenance of harmonious Labour Relations on pay, conditions and ethnic issues.

Contractor's staff shall be suitably trained and experienced in the maintenance of harmonious labour relations. Contractor shall use its best efforts to ensure that any industrial dispute within the construction work force does not cause interference with MRPL/PMC operations or other Contractor's operations

Contractor shall inform MRPL/PMC of any strikes or threatening labour disputes or disturbances, which may lead to a work stoppage or disruption.



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Contractor shall prevent any unlawful, riotous or disorderly conduct amongst its Sub-contractors or its own employees.

Contractor shall ensure that expatriate personnel do not take part in political action, or interfere in local political matters, and Contractor shall include a clause to such effect in all Subcontracts.

Contractor shall develop a mutual working relationship with the Local Community, which maintains harmonious public relations during the total period of the Contract. Contractor will be expected to ensure that the activities and the behavior of the workforce employed by itself and its subcontractors, conduct itself in a responsible and appropriate manner.

### 1.12 LOCAL CONDITION - HOLIDAYS

Contractor and its Sub-contractors shall not work on the scheduled weekly day of rest, any recognized India public holiday or outside the hours of daylight, without MRPL/PMC approval. Three days' notice is required. Contractor shall identify the work he proposes to carry out and provide sufficient safety and supervisory personnel to control the work. Contractor shall identify any support or inspection work required from MRPL/PMC.

## 2 PROJECT CONTROLS

### 2.1 CONSTRUCTION PROGRESS MONITORING AND REPORTING



Contractor is referred to Project Procedure 20005-GEN-G-DOC-9105 – Planning, Scheduling, Progress Control and Reporting.

MRPL/PMC will monitor Contractor's progress against the Schedule, advise Contractor of any factor or concerns which may have an adverse impact on the Schedule. Contractor shall recommend the appropriate corrective action to be taken, and subsequently MRPL/PMC will monitor the action taken by Contractor to ensure satisfactory progress of the Work is attained.

### 2.2 CONSTRUCTION PLANNING AND SCHEDULING

The Schedule to be submitted by Contractor for approval by MRPL/PMC shall be based on the key dates provided whilst maintaining adherence to "world class" construction safety practices. The schedule shall fully recognize the requirement to progress underground works in their logical sequence taking account of relevant excavation depths and proximity's of various underground services and piling and foundations for equipment and structures. The schedule shall also recognize the need to establish a proper erection sequence for all major/large items of equipment in regard to the confines of the project site, the need to create maximum work faces and shall be based on and shall support the principle of systems completion to facilitate timely commencement of pre-commissioning. Pre-commissioning activities scheduling shall be developed to ensure the availability of utility systems in a timely manner to facilitate the pre-commissioning of process systems and units to support the effective coordinated completion of the project and its commissioning. The Schedule shall be established early during the Engineering phase of the Project and shall detail the breakdown of tasks, their duration's, start and finish dates. Critical paths activities shall all be clearly defined. The Schedule shall be 'commissioning needs driven' at all times.

Contractor shall provide a level 3 schedule for each defined Unit clearly identifying critical path activities, shutdown and tie-in activities and erection sequence. Contractor shall provide sufficient relevant detail to form the basis of Level 4 schedules to be provided by Sub-contractors. These

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Individual level 3 Unit schedules shall be summarized into an overall level 2 schedule for the Project.

Contractor shall ensure that it coordinates all construction interface activities between its various Sub-contractors and between them and its own construction activities. Contractor shall ensure that it coordinates all its Sub- contractors “Level 4” planning of all construction activities and interfaces of various/units and disciplines to ensure to the coordinated completion of individual systems.

Contractor shall make available to MRPL/PMC all Contractor’s and Sub-contractor’s Level 4 Schedules.

### 3 QUALITY MANAGEMENT

#### 3.1 QUALITY SYSTEM

Contractor shall establish a Quality Assurance and Quality Control Group within its field organization. This group shall be directly responsible to Contractor’s Corporate Quality Assurance and Manager and shall also report to the Project Director/Project Manager.

The quality control personnel shall be familiar with applicable National and International codes and standards, Indian statutory requirements and Project Specification and Standards. Contractor is required to manage and implement an overall Quality System that complies with ISO 9001: 2000.

Contractor’s site Quality Assurance personnel shall implement a comprehensive programmer of internal quality audits of site activities, including its and its Sub-contractor’s work. The audit schedule shall be provided to MRPL/PMC for its prior agreement.



Contractor shall engage either the services of an independent Consultant or use his competent in-house group to audit adherence to the agreed Project Quality Plan. Such audits will be conducted on a quarterly basis or as directed by MRPL/PMC. Any CONSULTANT shall be approved by MRPL/PMC prior to engagement of its services on the Project.

#### 3.2 CONSTRUCTION PRACTICES

Contractor shall prepare and submit for review by MRPL/PMC, all required construction procedures. Contractor’s Quality Plan for the Project shall include a complete listing of all procedures it intends to produce for proper control of the Site activities and shall ensure that the principle of risk assessment and constructability is maintained throughout the total period of the Project. All procedures developed by Contractor’s home office organization shall be reviewed by MRPL/PMC.

All Construction Procedures shall be submitted to MRPL/PMC for review at least one month prior to the commencement of the specific construction activity to which they relate.

MRPL/PMC will audit and, if applicable, reject the Work performed by Contractor, if it is not in accordance with the Project Specification and/or other Contract documents and subsequently require Contractor to achieve the required quality established for the Work.

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### 3.3 TOTAL QUALITY MANAGEMENT (TQM)

Within the Quality Management System Contractor shall identify how he proposes to implement a TQM strategy that provides the means for not only achieving the required quality but will provide continuous improvement throughout the Project.

All Contractor's quality management documents shall be available electronically for access by MRPL/PMC at any time.

### 3.4 QUALITY ASSURANCE PLAN

Contractor shall develop a Construction QA plan which shall be an integral part of the Project QA plan, and is to be issued for review within 30 days of Contract award.

### 3.5 QUALITY CONTROL PLAN

Contractor shall carry out a quality control programme during CONSTRUCTION and produce objective evidence of quality of the Work, to ensure that the Work is being executed to the Project Specifications and that the facilities shall perform entirely satisfactorily once in operation.

Contractor's Construction Quality Control Plans (QCPs), shall be separate for each major activity or/and area of the Work, and shall incorporate Inspection and Test Plans identifying all activities and shall incorporate all relevant witness and hold points, which are to be previously agreed with MRPL/PMC .

These shall include for Indian Statutory Requirements and Third Party Inspections.



Contractor shall use MRPL/PMC's or prepare a comprehensive set of Construction Quality Control Inspection and Test Check Sheets for all engineering disciplines and construction phases of the Work up to Completion, as necessary to meet the requirements needed to achieve Contract Completion . These are to be agreed with MRPL/PMC prior to use and shall be collated in separate files for each system as part of the documentation needed to be incorporated into the respective system Completion Manual and system Quality Control dossier.

Contractor shall prepare a comprehensive "punchlisting" procedure, and directives, for the process of determining completion of mechanical installation works relevant to state of readiness for the performance of testing of the installation. This shall cover civil works, structural, mechanical- static and rotating, piping, electrical, instrumentation and miscellaneous services and for establishing integrity of other components of the facility. Contractor shall demonstrate its procedure for ensuring that its Sub-contractors perform rigorous inspection and identification and correction of deficiencies prior to their submission to Contractor for performance of testing. Contractor shall further demonstrate that it has performed its inspection of the system/installation to be submitted for testing/inspection and that corrections of deficiencies have been performed prior to submission to MRPL/PMC for acceptance/inspection.

Contractor shall describe its procedure for scheduling and co-ordination of the completion of components of systems to achieve a state of readiness for pre- commissioning. Contractor shall specifically describe its proposals for ensuring coordinated progressive completion of instrumentation installation and pre-commissioning to support pre-commissioning and commissioning of processing systems pre-commissioning Construction Contracts.

Contractor shall ensure that its schedule of completion is developed with MRPL/PMC such that consistency with the overall plant commissioning is achieved.

Contractor shall develop, for MRPL/PMC's approval, the Mechanical Completion Procedure.

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## 4 CONSTRUCTION CONTRACTS

### 4.1 SUBCONTRACTS

Contractor shall submit, with its bid, its proposed Sub-contract strategy. The extent of any proposed subcontracting at all levels down to the direct labour element, shall be addressed in this Sub-contract strategy.

Contractor shall provide documentation, acceptable to MRPL/PMC, demonstrating Contractor's efforts to maximize the utilization of Indian resources in the execution of the Work and to appoint suitably qualified and skilled Indian Sub- contractors. Such documentation shall be provided with Contractors bid for MRPL/PMC review and approval and consideration in evaluation of bids.

The approval by MRPL/PMC and subsequent Contractor's use of any/all Sub- contractors does not relieve Contractor from any of its responsibilities regarding the execution of the Contract.

### 4.2 COMMON USER PLANT AND EQUIPMENT

Contractor shall propose, within his Subcontract strategy how he will appoint contracts for common use plant and equipment for all types of the construction Work and temporary facilities

Items that may be considered in such a strategy could involve but not be limited to:

- Scaffolding
- Welding machines
- Craneage
- Transport vehicles (passenger and material/equipment)
- Toilets
- Local and satellite/remote office accommodation

## 5 MATERIALS MANAGEMENT

### 5.1 VENDORS



Contractor is responsible for identifying Vendor's representatives that are required to attend the Site during the construction phase and after Final Test Certificate issue.

Contractor shall propose his strategy for Vendor representative to support construction and Pre-commissioning activities.

### 5.2 CONSTRUCTION EQUIPMENT AND MATERIALS

Contractor is responsible for all materials during receipt, custom clearance, handling, transportation, inspection, storage, preservation and installation, until Final Test Certificate.

Contractor shall inspect all materials immediately upon receipt at Site and any damage to such materials shall be recorded. Contractor shall take appropriate measures for immediate repair and/or replacement of damaged materials.

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Non-conformance of materials to the Project Specification shall be processed in accordance with a Procedure to be submitted by Contractor for MRPL/PMC acceptance, refer to Project Specs.

Only materials necessary for the execution of the Work may be present on the Site. Construction equipment and materials shall not be removed from the Site without prior written consent of MRPL/PMC. Contractor shall agree with MRPL/PMC's security personnel a system for the movement of materials and equipment in and out of the facilities.

Contractor shall propose for MRPL/PMC's approval, a fully auditable system, which shall account for all materials imported into India. Once MRPL/PMC accepts this, it shall be fully implemented by Contractor.

Any proposed Materials Tracking and Control System shall provide for, but not be limited to the following cases, and be linked to Contractor's off-site procurement centers:

Materials incorporated into the Project:

- Surplus material at Provisional Acceptance.
- Surplus material sold to MRPL/PMC.
- Surplus material re-exported by Contractor and or/its Sub-contractors.
- Surplus material otherwise disposed of by Contractor and/or its Sub- contractors.
- Scrap materials collected and disposed of on a regular basis during the period of work execution.

Contractor shall at all times strictly control the issue of materials to its Sub- contractors.

The issue of materials by Contractor to its Sub-contractors does not relieve Contractor of its obligations to ensure their proper storage in accordance with the Positive Material Identification and Materials Segregation Procedures, established for the Project.

Contractor shall be responsible for making any required provision for bonded area(s) at all ports of freight consolidation, for the receipt of imported Project materials, and shall obtain both MRPL/PMC and Indian Customs' acceptance of said areas.

Contractor shall develop a procedure in conjunction with the MRPL/PMC and the Indian Customs Authorities, for the receipt and clearance of all Project materials at Site.



### 5.3 CONTROL OF MATERIALS AT THE SITE

Contractor shall provide a computer based Materials Tracking and Control System, acceptable to MRPL/PMC, to provide continuous control of all materials from materials take-off, issue of requisitions, through to the final location of the materials on Project Site. The Material Control System at Site shall be linked electronically to Contractor offshore procurement centres.

The system shall also control surplus, overage, damage, scrap and materials discrepancies.

All imported materials shall be fully traceable for India Custom's auditing, if required. Any imported materials overages, wastage or scrap shall be disposed of in accordance with current Indian Customs Regulations. Contractor shall prepare a procedure for MRPL/PMC acceptance in this regard.

All materials control procedures and formats shall be subject to review by MRPL/PMC.

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Contractor shall issue to MRPL/PMC each month a Material Status Report. The report shall be in the format agreed with MRPL/PMC and shall cover all materials.

The Materials Status Report shall contain as a minimum the following information:

- Requisition number and Order number with latest revision number.
- Description of materials and item number.
- Planned, forecast and actual issue dates for:
  - Requisitions
  - Proposed Vendor List, being derived from MRPL/PMC Project Vendors List
  - Request for quotation
  - Receipt of quotations
  - Pre-order Evaluation Package to MRPL/PMC.
  - Pre-order Evaluation Package approved by MRPL/PMC.
  - Purchase Order
  - Vendor Data, approved MRPL/PMC.
  - Delivery Ex-Works
  - Site Receipt
- Vendor's name, country and/or origin of goods.
- Contractual delivery date.
- Vendor's latest delivery promise, last check date, method (personal visit, fax, telex, etc.).
- Final Inspection Notice.
- Shipping Schedule for all materials deliveries to the Site.

Note: Part shipments shall also be shown.

The Materials Status Report shall also highlight those materials items where the forecast delivery to Site date has slipped to within four weeks of, or beyond, the required on Site date to meet Schedule requirements. Such items shall be regarded as critical.



Contractor shall supply MRPL/PMC with exception reports for critical and overdue activities concerning materials deliveries.

Materials Exception Reports shall be issued weekly.

In addition to the Materials Status Report Contractor shall issue monthly a Bulk Materials Status Report summarizing the following:

- Required bulk quantity from consolidated take-offs.
- Quantity on order
- Quantity delivered
- Quantity used



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- Storage or overage

#### 5.4 CONTROL OF MATERIALS REMOTE FROM THE SITE

If Contractor intends to undertake a part of the Work remote from the Site, it shall obtain agreement from MRPL/PMC in writing prior to such action and shall ensure full access for inspection by MRPL/PMC during all stages of the execution of such Work.

The administration, security and control of bulk materials received at the facilities and transferred for prefabrication outside these facilities shall be subject to the prior approval by MRPL/PMC of a Materials Control Procedure to define Contractor actions in regard to Security and Quality Control.

#### 5.5 MARKING OF EQUIPMENT AND MATERIALS

Contractor shall assign all materials with a relevant identification number.

All bulk materials shall also be suitably identified, in particular piping materials shall be clearly identified as to type. When divided into smaller fabricated parts, each part shall carry the required identification of spool and isometric numbers.

#### 5.6 PRESERVATION

Contractor shall preserve materials stored or standing idle prior to Ready for Start-Up in accordance with Vendor's preservation requirements. Contractor shall issue a material preservation procedure, incorporating standard preservation activities needed during construction and incorporating Vendor's requirements needed to satisfy their guarantee.

The materials preservation procedure shall be issued for MRPL/PMC's review prior to first order placement and shall be coordinated with Vendor's packaging procedures and preparation of materials for shipment requirements.

Contractor and its Sub-contractors shall take all necessary precautions to protect materials from damage by the elements, including the provision of all necessary air-conditioned storage. Dissimilar material shall be kept separate to prevent contamination.

Contractor shall ensure that it and its Sub-contractors take all necessary precautions to protect materials from damage during all construction activities.



Contractor shall ensure the inner cleanliness of all materials prior to final connections. Prefabricated piping and equipment not yet installed shall be laid down on adequate temporary supports. Adequate measures shall be taken to ensure the protection of piping and equipment from the ingress of sand and other foreign matters. All flange facings and beveled ends shall be coated with a non-drying oily film type rust preventative and subsequently protected by wooden or hard PVC covers.

The issue of materials by Contractor to its Sub-contractors does not relieve Contractor from its obligation to ensure their preservation in accordance with the Project Specification.

Attention is particularly called to the possibility of internal stress corrosion cracking of welds in stainless steel pipe stored in saliferous atmospheres. To prevent this type of cracking Contractor shall:

- Ensure the integrity of the pipe covers.



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- Store pipe in an inclined position allowing any condensation to be drained by means of a 10-mm hole drilled in the bottom edge of the lower pipe protection cap.

Large bore piping 30-inch and above shall be mechanically cleaned internally and visually inspected internally.

All pipelines shall be flushed after completion of pressure test. Contractor shall carry out chemical cleaning where required prior to Final Test Certificate in accordance with Job Procedure for Flushing and Blowing of Lines and Equipment.

Contractor shall also clean the relevant piping externally, in addition to the cleaning of sump pits, equipment, tanks, buildings, etc., to the satisfaction of MRPL/PMC's

## 6 CONSTRUCTION ENGINEERING

### 6.1 HOME OFFICE CONSTRUCTION

Contractor shall ensure that suitable construction personnel are assigned to the Project during the design phase to ensure construction strategies and constructability are effectively addressed.

Contractor shall ensure that, as a minimum, its designated Site Construction Manager and Planning Engineer are assigned full time as part of its Project management team during the initial Engineering and Procurement phase of the Contract.



### 6.2 CONSTRUCTION STRATEGIES

The construction strategy shall consider and address potential for the use of skid mounted, Vendor package units, pre-assembled heaters and boilers, prefabrication and pre-assembly of structural steelwork and the pre-dressing of columns/vessels/exchangers prior to their erection. Construction strategies shall also take account of the method of delivery of materials to the Site and the subsequent transport to the Project Site, ensuring that the principle of constructability is maintained throughout all phases of the Project.

### 6.3 CONSTRUCTABILITY

Contractor shall submit for review by MRPL/PMC, its detailed Engineering Constructability Review Procedure. This shall typically address:

- |               |  |
|---------------|--|
| Detail Design | e.g. the detailed plan for the pre-dressing of vessels, cable laying, the engineering design strategy to minimize the level of risk during construction up to Final Test Certificate. Also addresses the extent of equipment pre-assembly. |
| Plot Plan     | e.g. the adequacy of areas for access and lifting operations, identification of the routes for the movement of large materials loads around the Site, site logistics plan and the construction erection sequence on the Project Site.      |
| Review Action | e.g. regular reviews by Contractor in order to ensure that the principle of Constructability is being maintained throughout all phases of the Project.   |

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#### 6.4 RISK ASSESSMENTS

Risk Assessment methodology shall be used to identify and assess Health & Safety and Environmental Hazards during field erection and testing up to Final Test Certificate. These hazards may be identified at any stage of the project; e.g. MRPL/PMC data, existing drawings, site survey investigations, design and Constructability reviews, or information that may emerge during the construction and Pre-commissioning phases.

Once potential hazards are identified, the risk to health and safety must be assessed. The assessment shall characterize the risk in terms of severity and probability.

From the risk assessment, a method statement shall be developed which at best would eliminate the risk or as a minimum, would contain the risk to an acceptable level. If the work is similar to other work which has been assessed for risk, the original assessment may be modified to suit the specific circumstances.

All risk assessments, (together with associated detailed job specific method statements) generated throughout the duration of the Project shall be retained by:

- Contractor Construction Manager
- Contractor Safety Management
- Sub-contractors



Contractor shall carry out, during detail design phase-prior to commencement of construction operations, comprehensive risk assessments in regard to all its construction operations, and particularly in respect of those that will take place alongside existing facilities. Contractor shall ensure that the identified risks are addressed in the design so as to mitigate any impact of any adverse factors. Risk assessments shall be carried out progressively during the course of construction to address the changing phases and nature of the works.

#### 6.5 METHOD STATEMENTS AND CALCULATIONS

Detailed Method Statements shall be prepared by Contractor and/or its Sub- contractors for all work which has risks to health and safety, as determined by risk assessment. These Method Statements will describe the work procedures, sequence of operation and the controls necessary to achieve effective management risk, and efficient execution of the works.

Detailed job method statements shall be prepared for all critical tasks such as:

- Piling
- Heavy lifts
- General rigging and fitting
- Vessel entries
- Live line welding (Hot Taps)
- Excavations below 1.2 m depth
- Grating and handrail installation/removal
- Heat treatment/stress relieving
- Any erection work with specific risks

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- Work which is deemed to be novel
- Any work that involves the handling of hazardous substances

This method statement shall, among others, describe:

- The job to be undertaken
- The individual activities required to complete the job
- The sequence of the various activities in the execution of the work
- Plant, equipment, tools to be used in each activity
- Substances/chemicals to be used in each activity
- Control measures and procedures to be used for each activity
- Personal protective equipment required
- Emergency resources required, e.g. fire watchers, fire extinguishers, fire blankets
- Name of supervisor for each activity
- Name of person in overall charge of the job
- Novel procedures may require demonstration or training exercises
- Any specific known hazards to be listed (e.g. Presence of asbestos, pyrophoric, contaminated soil, etc.) particular attention should be paid to refurbishment or demolition of existing plants.
- Process fluids and chemicals likely to be encountered

Method statements shall be submitted to MRPL/PMC at least fourteen (14) days prior to the anticipated commencement of the work. The method statement shall be reviewed by MRPL/PMC. Audits of method statements shall be carried out by Contractor's Safety Management Team.

Method statements shall also be submitted with the applications for various permits for performance of works with in existing facilities.



## 6.6 LIFTING STUDIES

Contractor shall develop a schedule of heavy lifts. The lifts shall be classified in terms of their criticality. Contractor shall provide his procedure for the evaluation of heavy lifts. The procedure shall incorporate any special MRPL/PMC requirements. All critical lifts shall be described in lifting studies and detailed method statements. The lifting schedule together with the procedures shall be submitted to the MRPL/PMC for review at least six weeks prior to the planned date of the particular heavy lift.

Contractor shall identify any major heavy lifts which may impact, and require special accommodation within, the detailed design or which may otherwise seriously impact the construction installations sequence.

Contractor shall employ an experienced, competent and responsible person or Specialist Contractor, previously approved by MRPL/PMC, to be in charge of all lifting operations.

Lifting Studies shall comprise, as a minimum, the following data:

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- Dimensional Plan and Elevation drawing, showing all stages of movement of the load, from initial to final installed position.
- Details and capacities of jacks, skates, chain blocks being employed and the locations on or under the load.
- Angles of chain blocks doing the operation and method of attachment to the load and supporting steelwork or structure.
- Details of skid beams, channels and packing arrangement under the beams or channels.
- Loads imposed by skates or jacks on supporting floors/ground and the arrangement for dispersing such loads to acceptable design limits.
- Method statement for the entire lifting operation, indicating how Construction equipment will be installed, load erected and Construction equipment removed.
- Detailed calculations as appropriate, including any spreader beam capacities and Load Safety Factors.
- Itemized checklist for the entire lifting operation.
- Original Crane Certificate of Inspection/Load Rating, for the crane(s) and all lifting tackle to be used in the lifting operation. Such certificates, and any requirement for additional testing, shall be in strict accordance with Indian Regulations.

Contractor shall submit the above information for each lifting study six (6) weeks prior to the planned date for the designated lift.

## 6.7 TRANSPORTATION STUDIES



Contractor shall make provision for:

- Off-loading materials direct from sea-going vessels at the Project Jetty, transport to designated laydown areas.
- All necessary permits associated with the transportation of materials using public facilities such as the harbor and public roads, including police escorts if applicable.
- All temporary facilities for the transport and intermediate storage of materials (e.g. reinforcement of roads, culverts, foundations for crane outriggers, etc.), including any required permits.
- Removal and restoration of all obstructions previously removed to facilitate the transportation and erection of materials.

Contractor shall make available to MRPL/PMC, developed plans and procedures with respect to the above at least four months prior to the planned date for the first off-loading and transportation of materials.

## 6.8 FIELD DESIGN CHANGE CONTROL

Contractor shall submit his procedure for the identification and resolution of any proposed changes to the design during the construction phase. This procedure shall identify the reasons why the change is required and the proposed change.

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The Design Change Control procedure shall show all changes are controlled through correct engineering and how all agreed changes are incorporated into the as-built drawings and model.

A register of design changes and design queries shall be kept for each Sub- contractor and discussed at the relevant weekly progress meeting.

## 6.9 CONSTRUCTION DEFECTS

During prefabrication, pre-assembly and installation of materials at the Site, Contractor shall keep a register of all construction defects identified by his own QA/QC inspection team and MRPL/PMC. All such identified defects shall be rectified in accordance with the original design.

## 7 SITE FACILITIES AND LOGISTICS

### 7.1 SITE INFORMATION

#### 7.1.1 SECURITY

Temporary and permanent access points which service the new construction area.

#### 7.2 TEMPORARY FACILITIES

Contractor shall maintain in good condition throughout the construction period and up to Provisional Acceptance, all temporary facilities as defined in the Project Procedure being required to accommodate all its personnel and the personnel of its Sub-contractors, Vendors Representatives and all temporary facilities are to be ready prior to the start of site Work.

Contractor shall be allowed to accommodate up to four full time MRPL/PMC Representatives in his Temporary facilities complete with computers, telephones, office furniture etc.

Contractor shall determine area allocation, sizing and layout of temporary facilities, buildings and fences and allocation of Sub-contractor areas in consultation with MRPL/PMC.

Contractor shall be responsible for planning the most effective use of the available space. Contractor shall prepare a detailed layout drawing and plan showing the utilization of the available area and submit them for approval to MRPL/PMC

Contractor shall advise MRPL/PMC of the area it will require to accommodate its Temporary Facilities.



Contractor shall relocate, extend and upgrade the existing roads, fences and culverts as may be required for the execution of the Work and the transportation of materials. This being subject to specific prior agreement in writing from MRPL/PMC.

Contractor shall restore such relocated and/or extended facilities to their original conditions upon completion of the Work, and/or not later than the date of Provisional Acceptance unless otherwise agreed by MRPL/PMC. Contractor shall also remove any temporary fencing and reinstate any roads, fences and culverts upon completion of the Work.

Contractor shall provide all cleaning services for its temporary facilities.

Contractor shall provide for the treatment of all termites and insects in its offices.

Contractor shall remove all its temporary facilities and those of its Sub- contractors and make good the Site, upon its demobilization from the Project unless otherwise agreed by MRPL/PMC.

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Contractor shall provide all cleaning services for MRPL/PMC's offices, and surrounding areas, and shall dispose of all office waste materials in the prescribed manner.

### 7.2.1 COMMUNICATIONS

As part of his temporary facilities Contractor shall provide a communications system between the Site and its design office. Contractor shall detail his communications system both to its design office and locally within the Site.

### 7.2.2 SANITATION

Contractor shall ensure the provision of adequate sanitation including sufficient WCs, urinals and washing facilities for all personnel within the office accommodation area and within the Project Worksite areas. Project Site WCs may be of the portable chemical type. All sanitary facilities shall be maintained on a daily basis.

Contractor shall ensure that sewage is disposed of to an approved disposal and treatment facility for its effective treatment to world-class standards.

### 7.2.3 MESSING AND CANTEEN FACILITIES

Contractor shall provide and maintain adequate messing facilities for their employees on site.

### 7.2.4 MEDICAL FACILITIES

Contractor shall provide a medical Centre staffed by a fully qualified nurse to be available for basic medical and first aid treatment.

Arrangements shall be made with local hospitals for treatment beyond the capability of the site medical establishment.

Contractor shall make provision for an on-site ambulance, in the case of emergencies, for immediate access and transport to the local hospital.

## 7.3 UTILITIES FOR CONSTRUCTION



Contractor shall provide a Potable Water distribution system from the MRPL/PMC provided supply at his designated areas. Water at the construction workface shall be free of charge. Water at the fabrication area and camp shall be charged at the Contract rates. Contractor shall provide meters at these points.

Contractor shall arrange its supplies of water for hydro test and flushing of equipment and piping systems. Contractor shall allow for collection and distribution from MRPL/PMC's supply point. Hydro test water shall be reused where possible.

Contractor shall provide and maintain all temporary electrical facilities. The temporary electrical installation shall meet all electrical safety regulations required under the Project Specification and Indian National Electrical Codes. MRPL/PMC- provided power shall be charged at the Contract rate. However Contractor is responsible for providing sufficient power generation for total work scope.

Records of inspections by Contractor of all temporary electrical equipment installed by Contractor and its Sub-contractors are to be kept by Contractor.



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Electrical distribution systems shall generally be underground conveniently positioned to local weatherproof distribution boards.

Underground cables shall be buried and protected at sufficient depth and at locations to avoid disturbance from construction work. Cable markers and warning tape shall be installed above the cables, all in accordance with sound international practice. Accurately annotated drawings for all buried temporary facilities are to be maintained. Temporary cables shall be removed as soon as practical

Contractor shall install earthing for electrical equipment.

Contractor shall install a temporary lighting system to guarantee safe working conditions prior to undertaking any night-time work by it or its Sub- contractors.

#### **7.4 TRANSPORTATION (ON AND OFF SITE)**

Contractor shall make reference to main transport routes to be used within the facilities during the construction phase. Contractor shall follow these guidelines but shall identify to MRPL/PMC any other access roads it proposes to use to allow full and free access to extra-long and heavy load transport vehicles. The proposal shall identify increased road turning radii and increases in road widths, such works are to be adequate to withstand all imposed road loading.

Contractor shall be fully responsible for the coordination with Indian Authorities in regard to the use and/or temporary modification of any public roads it proposes to use for the transport of extra-long and heavy loads. Such works shall be entirely to Contractor's own costs.

##### **7.4.1 PERSONNEL TRANSPORTATION**

Contractor shall provide directly all the necessary transport for its and its Sub- contractors' personnel to, from and on the Site at all times.

Contractor shall provide adequate parking facilities adjacent to its site offices and that of its Sub-contractors.

Access for private vehicles to the Site office accommodation area shall be strictly limited and will require an Entry Pass issued by Contractor's security personnel on approval of MRPL/PMC. Contractor shall, after consultation with MRPL/PMC, establish an entry permit procedure and ensure its full implementation. Private vehicles will not be permitted either in the Construction area or any operational area.

Contractor shall designate his vehicles necessary for transportation and construction purposes that will be permitted entry to the construction and operation areas.

All such vehicles, which are to enter any existing operational facilities, shall be fitted with a spark arrestor approved by MRPL/PMC and be subject to inspection by MRPL/PMC.



All vehicles will be the subject of inspection to ensure their roadworthiness prior to issue of passes.

##### **7.4.2 TRAFFIC PLANNING**

The construction site shall be organized in such a way that pedestrians can move safely and without risk. Consideration will be given to:

Development of detailed layout drawings from the Construction Site Logistics Plan



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Separate gates for vehicle and pedestrian use.

Separation between vehicles or pedestrians where practicable.

Private vehicles shall not be permitted within any construction areas and operating plant areas.

Contractor shall make provision for transporting of workers to construction areas.

Traffic management shall be coordinated by MRPL/PMC in consultation with all Contractors.

## 7.5 CONSTRUCTION LAYDOWN AND WAREHOUSES

Contractor shall define his construction laydown and fabrication requirements and advise MRPL/PMC at the time of Tender. If Contractor requires additional or temporary laydown areas adjacent to the Project Site, he shall be responsible to source these areas and identify any potential for disruption to traffic and plant personnel access, and request MRPL/PMC's approval.

All laydown of vessels for pre-dressing and piping for prefabrication shall be carried out within the designated areas and all safety rules shall apply. Access to these areas shall be restricted to properly badged personnel and vehicles with passes.

Bulk pipe materials storage yards shall be provided, laid out and controlled by Contractor to ensure that material segregation is maintained at all times.



Contractor shall provide ample temporary covered warehouses, air- conditioned where necessary, for all permanent works materials which, in accordance with Suppliers recommendations and good engineering practice, should not be left unprotected (e.g. gaskets, rotating equipment, compressors, electric motors, small piping materials, small valves, instruments). Contractor shall arrange a fenced storage yard for Equipment and materials which do not require weather protection. Storing and handling of materials shall be in strict accordance with the respective manufacturers' recommended/handling storage procedures, including humidity and temperature storage criteria. Contractor shall provide its storage and materials receipt and issue procedures to MRPL/PMC for approval.

A secure fence shall surround the whole area. Warehouses shall have concrete floors, racking, issue counters and access doors for trucks. Separate, secure areas are to be provided for small items of value and for materials quarantine storage purposes.

Materials receipt/inspection areas shall be established by Contractor, for materials supplied not in accordance with Project Specification and applicable Engineering Design Codes a separate fenced MATERIAL quarantine area shall be provided by the Contractor.

## 7.6 TEMPORARY OFFLOADING FACILITIES

Contractor is required to demonstrate that it has carefully considered all potential Temporary Offloading Facilities and that Contractor has developed strategies for the offloading of major equipment either at the recognized ports or at any of the facilities. Contractor shall advise if it has considered the construction of any new temporary offloading facility in close proximity to the Project. Contractor shall submit documents to MRPL/PMC and all third parties for their approval regarding its method statement and procedures relating to the use of any Construction Jetty, which Contractor may provide, and the sea lane approaches to it.

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## 7.7 DISPOSAL OF PERMANENT WASTE

During construction, Contractor shall remove all waste, scrap and excess material each day from all work areas, or as directed by MRPL/PMC.

Litter, garbage and similar waste shall be disposed of by Contractor in locations previously authorized by MRPL/PMC.

Contractor shall dispose of all unwanted abrasives, used in any blasting process to be carried out prior to painting, via a specialized company approved by MRPL/PMC. Alternatively, these materials may be taken away for recycling by Contractor.

Contractor shall ensure that all waste engine oil and lubrication oil is properly contained, recycled or otherwise disposed of in a manner that meets with the approvals of the regulations of India and in any event does not present a threat to contamination of the environment. Contractor shall advise its proposals to MRPL/PMC.

Permanent waste such as tins, cans, locally procured waste construction materials etc., shall be gathered in containers within the areas allocated by MRPL/PMC and dumped in authorized locations or otherwise disposed of at maximum seven days intervals, or as directed by MRPL/PMC .

Scrap from imported materials must be gathered and disposed of in accordance with the procedure to be developed by Contractor which shall be subject to approval/agreement of MRPL/PMC.

Excavated soil and any clear fill material, surplus to requirements, shall be dumped by Contractor in places authorized and previously approved by MRPL/PMC.

## 7.8 APPEARANCE OF SITE AND CLEANING

Contractor shall provide and maintain at all times, an effective, temporary, site drainage system during the construction stage of the Project.

Contractor shall maintain good housekeeping across the entire Site and in particular maintain construction roads surface condition and clear access on each side of all such roads.



Contractor shall prevent any vehicle from parking on the Site roads.

Contractor shall not 'wash down' earth moving or concrete transportation vehicles on site roads and shall ensure that the cleanliness of site roads is not adversely affected by construction traffic usage.

Contractor shall ensure that Construction equipment is grouped and laid out in a neat and orderly fashion throughout the Site.

Contractor shall install silt control measures to ensure that road side drains do not become blocked with sand/silt during dewatering activities.

Contractor shall develop a temporary cable strategy for welding machines, power tools and lighting, throughout the Site that groups them, eliminates tripping hazards and minimizes damage potential.

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### 7.8.1 FINAL CLEANING

Contractor shall, after completion of all work, remove from the Site all temporary constructions; buildings and those materials left over from construction, which the MRPL/PMC does not wish to retain.

Contractor shall disconnect and remove all temporary wiring, plumbing, etc. and shall dispose of all waste and scrap to locations agreed with MRPL/PMC, leaving the Site and the dumping areas in a clean and orderly condition to the entire satisfaction of MRPL/PMC.

An authorized representative of Contractor shall remain at Site until all cleaning work has been completed to the satisfaction of the MRPL/PMC.

### 7.9 TOOLS AND EQUIPMENT

All Contractors' tools and equipment shall be fit for purpose, and maintained in a safe working condition. Guards and electrical trip switches must work effectively and must not be removed or bypassed. Homemade tools are not permitted. Sub-contractors shall provide suitable facilities for the storage, and shall be responsible for the security, of their tools and equipment.

All electrical equipment (including leads) shall be inspected and tested in compliance with regulations. Equipment shall be tested prior to shipment to site. Contractor shall employ the service of a competent person to inspect, test and tag all electrical equipment. A test schedule shall be put in place and portable site tools inspected at intervals not to exceed 3 months.

Contractor shall keep, on site, a register of all electrical tools and equipment in use. The register shall detail:



- Individual identity number of the tool.
- Name, signature and company of the competent individual who performed the inspection/test.
- Date of inspection.
- Condition of the tool, details of repairs and any withdrawal from use.
- The following minimum standards apply:
- All electrical equipment will be tagged, as tested.
- All equipment shall be earthed, e.g. lighting towers, distribution panels, generators.
- Spark-free (anti-spark) tools/hammers shall be used in live plant area for tie-ins/modification jobs.

All electrical leads shall be in good condition and shall be connected to the power source through standard industrial water proofed plugs and sockets which shall be in good condition.

### 7.10 MOBILE PLANT AND EQUIPMENT

Contractor shall provide all Construction equipment necessary for the effective execution of the construction of the Work.

All Construction equipment shall meet all Indian statutory requirements, be in good condition, well maintained and protected against climatic conditions, to ensure safe working and availability of

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the Construction equipment at all times. All Construction equipment intended for use on the Site shall also conform to the specific rules and requirements of MRPL/PMC

Regular inspection and testing of Construction equipment shall be carried out in accordance with site safety regulations, as a minimum requirement, and Contractor shall keep records of these inspections. Contractor shall not allow the use of any Construction equipment, which is unsafe or unsuitable for the task it has to perform. MRPL/PMC shall stop the use of any Construction equipment deemed unsafe or incapable of performing the Work to the required standard; such Construction equipment shall be replaced immediately at Contractor cost. MRPL/PMC will consider no Schedule effect claim in this instance.

The use of a man-basket from a crane will only be considered in extreme conditions and needs prior special inspection of the equipment and safety harness attachments of both operators to crane hook, by Contractor Safety Officer before use. The use of a man-basket shall only be considered if there is no other feasible alternative method. Contractor shall obtain MRPL/PMC's approval prior to use of a man-basket in each instance.

Schedule implications shall not be considered sufficient reason for use of a man-basket. Contractor is to plan its work on the basis that man-baskets are not permitted. The use of a bosun's chair is not permitted.

Contractor shall ensure local provision of servicing and repair facilities for Construction equipment and a stock of spare parts and consumables at Site or in the area, to avoid delay to the Schedule in case of any Construction equipment breakdown.

Contractor shall adhere to the Project colour coding system for Construction equipment.

Only vehicles that have been approved by MRPL/PMC shall be used within the facilities in order to minimise site traffic. Only Personnel who have been instructed in the following shall be permitted to drive Contractor's and Sub- contractors' vehicles brought on site:

- Site speed limits
- Limitations of access to construction areas
- Not to block access points, fire hydrants and to park in an orderly manner
- Keys to be left in the ignition at all times to allow emergency removal of vehicles



Persons who have a full driving license and registered as being competent shall only drive Contractor's and Sub-contractors' vehicles. Any violations of the site driving rules will result in the removal of the driver's name from Site list of permissible drivers.

All vehicles shall be well maintained, and subject to a planned maintenance programme.

Vehicles shall, as a minimum, comply with national regulations regarding testing for road worthiness and be fit for use on the Public Highway.

MRPL/PMC recognizes the risks associated with lifting activities and Contractor shall implement a system of control to minimize these risks. Equipment involved in lifting, e.g. Cranes, piling rigs, etc., shall:-

- Be tested, examined and certified within national legislation, and/or by third party certifying authorities' records to be available on site.
- Carry the manufacturer's operating manual and load charts in its cab; in a language understood by the operator.

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- Be subject to inspection by MRPL/PMC prior to entry to site.
- Have all safety devices and overrides operational.
- Be operated by competent persons who fulfil statutory requirements for the particular vehicle in question.
- Mobile crane operators shall demonstrate competence by an onsite test before they are approved to work and operate a crane.
- Have the operator carry out a daily check of the equipment, and a record of inspections, and defects found retained on site.

## 8 FIELD EXECUTION

### 8.1 CONSTRUCTION PRACTICES AND INSTALLATION PROCEDURES

Contractor shall be responsible for the direct and positive management of all its Sub-contractors' activities at Site; in particular for ensuring their construction progress and in the quality of the work performed by them. MRPL/PMC reserves the right to attend all Progress meetings held between Contractor and Sub-contractors, in order to monitor this action.

### 8.2 SITE INSPECTION AND TESTING

Contractor shall apply for and arrange for all necessary site inspections and tests by local government authorities. All such applications shall be Contractor's responsibility and shall be copied to MRPL/PMC for information.

Contractor shall carry out all site inspections and tests necessary to comply with Project Specification and to satisfy the requirements to achieve Contract Completion – refer to Construction Completion Checklist and is in addition to any inspection carried out at materials Vendor's and their sub-Vendor's works.

MRPL/PMC reserves the right to witness these site tests and inspections; Contractor shall therefore inform MRPL/PMC at least 48 hours before such site testing and inspection are due to commence, a longer period of notice shall be given for inspection at Vendor's works.



Contractor's site inspections shall take cognizance of any local authority, insurance or third party inspection requirements.

Contractor shall ensure that all stored materials have the identifications stipulated in the materials specifications.

Contractor shall provide the necessary testing, measuring and calibration facilities and tools.

Contractor shall provide proof of proper construction, with routine checks on the quality of the Work, by means of samples of construction Work, radiographs of welds, hydraulic pressure tests, leak tests, earth fault tests, etc., in accordance with the Project Specification and, when required, by MRPL/PMC .

If during testing the Work is deemed to be unsatisfactory, Contractor shall remedy the defects immediately at its own cost. MRPL/PMC will consider no Schedule effects claimed by Contractor in such instances.

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Final inspecting and closing up of equipment shall be witnessed and certified by MRPL/PMC and Licensor's Representative, where required. Equipment will only be closed after inspection and approval by MRPL/PMC.

The presence of MRPL/PMC at any test or inspection shall not relieve Contractor of its entire responsibility for the quality of the Work under the Contract.

Contractor shall provide reports of all necessary inspection/tests in accordance with statutory requirements, insurance party and Project Specification. Where applicable, these reports shall be in a form suitable for the requirements of such other parties as may be involved.

MRPL/PMC reserves the right to request any additional tests/inspections during construction by giving notice in writing to Contractor, who shall carry out the test/inspections including the preparatory/restoring works, to prove the Work has been satisfactorily executed.

Contractor shall agree with MRPL/PMC and thereafter implement a notification scheme for inspection with respect to Work to be covered or hidden from view.



MRPL/PMC shall be requested to inspect all underground Work installations prior to backfill. If Contractor backfills prior to such inspection he shall re-excavate to allow inspection to be carried out.

#### Vendor Specialist Supervision

Contractor shall, where necessary, provide Vendor specialist assistance to supervise erection, installation and final adjustments and to inspect and advise during testing, start-up and running in of:

- Complicated rotating equipment, e.g. generators, compressors and ancillaries, special pumps, proprietary equipment, etc.
- Refrigeration systems.
- Air conditioning equipment (central distribution systems)
- Integrated control and safeguarding systems and other special instrument items
- High voltage cabling, transformers and equipment
- Switchgear
- Variable speed control equipment (if used)
- Fire protection systems and equipment
- Programmable shutdown logic systems
- Telecommunications equipment
- Gas detection systems
- Fiber optic cable testing and jointing
- Analyzer and other specialist instrument equipment
- Tight shutoffs, hard and soft seat valves, etc.
- PTFE lined piping
- Water treatment systems



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- Hoists and lifting equipment
- Road and Marine Tanker loading arms
- Vaporization system
- Effluent treatment packages
- Specialist construction supplies and services, e.g. concrete additives, concrete anchors and fixing equipment, specialist bolting equipment, hot tapping equipment, grouting, fireproofing, refractory, pipe wrapping/coating/jointing equipment etc.

In addition Vendor's and Licensor's specialists shall be present during installation, final adjustments, testing, running-in, start up and initial operation of equipment, for which such presence is a condition of sale with respect to the Vendor's and Licensor's guarantees.

### **8.3 WELDING CONTROL, TESTING AND NDE**

#### **8.3.1 WELDING PROCEDURES**

Contractor shall submit its own and its Sub-contractors welding procedures for review and approval by MRPL/PMC prior to commencement of any welder qualification tests. Contractor shall consider the use of its own welding procedures in order to attain an early start to welding activities at site.

#### **8.3.2 WELDER'S QUALIFICATION TEST**

Prior to commencing work on the Site, all Welders assigned for the welding of equipment and piping designed and fabricated in accordance with one of the codes listed below, shall pass the qualification test as described in the latest issue of the relevant code:

- ASME Boiler and Pressure Vessel Code Section IX
- BS 5500
- ASME B31.1
- ASME B31.3
- INDIAN STANDARDS

In addition to ASME Boiler and Pressure Vessel Code Section IX, all welders' performance test plates shall be radiographed prior to mechanical testing. The acceptability of the welders shall be based on the quality of the radiographs and associated tests as specified.



Contractor shall invite MRPL/PMC to witness above tests, whether carried out on Work or elsewhere. All welder tests shall be witnessed by an independent third party to be appointed by Contractor. Such a third party is to be previously approved by MRPL/PMC prior to the start of construction welding activities.

#### **8.3.3 WELDING INSPECTION**

Contractor shall arrange for radiographic inspection of welds (NDT) to be carried out by an independent third party, previously approved by MRPL/PMC.

The radiographs shall be taken in accordance with the relevant engineering design code and the Project Specification.



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Safety measures and the required hot work permits, shall be discussed and agreed with the party responsible for operating the permit to work system and shall be in accordance with procedures approved by MRPL/PMC .

Contractor shall provide all facilities for the preparation, examination and storage of radiographic films and shall agree upon the details of the facilities for storage of radioactive sources with MRPL/PMC. Contractor shall provide such radiographic storage facilities at its own cost.

The quality of radiographs and ultrasonic inspection and acceptance criteria shall be in accordance with the applicable codes and Project Specification and established Project Quality Control Procedure.

Radiographic, ultrasonic and visual examination of welds shall be carried out as a routine check on the quality of work and as specified in the relevant engineering design code and Project Specification.

Welding and inspection of steel piping shall be done in accordance with the Project Specification and relevant engineering codes of practice.

In addition to being a check on the quality of welding, the radiographic spot check method shall also be used as a check on the performance of the individual welder. Spot radiography shall therefore be equally divided between all the welders employed. MRPL/PMC has the right to specify the location for spot radiographic checks.

MRPL/PMC may request additional radiographic spot checks and ultrasonic and magnetic flux tests on piping, tanks and equipment, all at no additional cost to MRPL/PMC.

Welds proven faulty shall be repaired and radiographed again by Contractor, entirely at its own cost.



If spot radiography should reveal unacceptable defects, then the level of inspection shall be increased in accordance with the applicable code requirements. The reasons for any such unsatisfactory welding shall be investigated and welders who cannot comply with the requirements shall be withdrawn for training and re-testing. The welder's certificate shall no longer be valid in such a case.

Stress relieving temperatures of welds shall be recorded on a valid calibrated chart recorder. The records and weld location shall be identified in an appropriate document, as previously approved by MRPL/PMC.

Contractor shall maintain a proper and up-to-date documentation system of radiographs identifying location and welder during the construction period. The system shall be agreed with MRPL/PMC prior to implementation. Locations of radiographs shall be identified in appropriate documents and be maintained during the construction.

A proper record system of welder performances shall be maintained by Contractor and shall include welder performance reports, rejection notes, persistent faults, etc.

Inspection reports shall be available for MRPL/PMC review at any time and handed over to MRPL/PMC prior to Construction Completion. Necessary reports and their formats shall be agreed upon with MRPL/PMC.

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## 8.4 SITE INSPECTION OF PIPE FABRICATION AND ERECTION

### 8.4.1 PIPING

Contractor shall produce and follow a comprehensive inspection and test procedure for all piping systems, taking into account the requirements of the Project Specification and applicable codes as well as the duties of the piping systems under consideration.

Contractor shall ensure that piping, fittings and valves are accompanied by the required original Material Certificates. Contractor shall establish Materials Identification Procedure for the Project in accordance with the Construction Quality Plan agreed with MRPL/PMC. This procedure shall be maintained throughout construction and up to Provisional Acceptance.

The inspection procedures shall be submitted to MRPL/PMC for approval/comments, and shall include the method of identification, verification and control to ensure that components of the correct materials are installed.

Contractor shall prepare hydrostatic test packs for all piping systems subject to such tests. These are to be approved by MRPL/PMC prior to use. System test packs shall form a part of the Project Quality Control documentation.

Contractor shall identify in its Sub-contract strategy the need or otherwise for specialist bolt tensioning techniques and when these will be mobilized.

## 8.5 SITE INSPECTION OF STEELWORK

Site inspection of steelwork shall be carried out in accordance with the Project Specification.

All steelwork shall be lined and levelled and grouted. Bolted steelwork shall be torqued to the correct settings and recording. Welding shall conform to the welding control procedures identified in this section.

MRPL/PMC will intervene and stop work that is being performed unsafely by Contractor and its Sub-contractors.

## 8.6 SITE INSPECTION OF MECHANICAL EQUIPMENT



Site inspection of mechanical equipment shall be carried out in accordance with the Project Specification, which include but are not limited to, those referenced in the following paragraphs. Material Identification, in accordance with a procedure prepared by Contractor and accepted by MRPL/PMC, shall be carried out for all materials inspected at Site.

All tests and inspections, which are to be witnessed and monitored by MRPL/PMC, shall be established in accordance with Procedures to be submitted by Contractor and agreed upon by MRPL/PMC.

### 8.6.1 COLUMNS, REACTORS, VESSELS, HEAT EXCHANGERS, FIRED EQUIPMENT ETC.

All columns, reactors, vessels, heat exchangers and fired equipment, etc., shall be subject to a further thorough inspection against Site Quality Assurance/Quality Control Procedures, previously agreed with MRPL/PMC, upon arrival at Site.

All materials fabricated at Site shall be inspected against Project Quality Assurance/Quality Control procedures, previously agreed with MRPL/PMC, prior to erection of such materials.

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Hydrostatic test procedures for all equipment and piping systems shall be prepared by Contractor and submitted to MRPL/PMC.

Column draw-off trays will be subject to a tightness test before closing up of column.

Prior to final closing up (after flushing), the Equipment shall be internally inspected by MRPL/PMC and Licensor Representative, as appropriate, to ensure cleanliness, dryness and correct assembly of internals, etc.

### 8.6.2 VALVES

Contractor shall re-test after trial fit-up, all safety relief valves, including pressure/vacuum valves, in an instrument workshop at the Site, against calibrated test instruments, in order to ensure the correct set pressure and tightness in accordance with procedures laid down in the Project Specification. Tests shall be carried out no earlier than 90 days prior to Contract Completion. Lead seals to be applied after testing. If after installation, seals are found to be broken, Contractor shall remove said valve, re-test, re-seal and replace at no cost to MRPL/PMC.

Valves shall not be repacked at the Site unless Contractor has available at the Site the Vendors' original certificates guaranteeing that these valves can be installed without any site testing and re-packing.

Contractor shall random spot check approximately 10% of the valves in order to ensure correct packing. This check shall be extended if packing's are found not to be in accordance with the requirements. Contractor shall keep full records of all such tests.

All valves shall be fully stroked through their full movement range prior to installation. Contractor shall maintain records of all such action.

### 8.6.3 AIR COOLERS, CONDENSERS

Contractor shall inspect all fan and drive bearings for cleanliness and proper lubrication.

Contractor shall check proper adjustment and operation of variable pitch fan blades.

Contractor shall check the direction of rotation of all motors before final coupling.



Contractor shall pressure test assembled equipment sections, together with the relevant piping, in accordance with the applicable code and Project Specification. Contractor shall submit all pressure test records to MRPL/PMC.

Individual noise and vibration tests shall be carried out to verify the manufacturer's guarantee, such tests may be witnessed by MRPL/PMC. Contractor shall submit all records of such tests to MRPL/PMC.

### 8.6.4 ROTATING EQUIPMENT

Contractor shall provide copies of its Standard Procedure for the installation of Rotating Equipment for MRPL/PMC approval. Vendor Instructions shall be obtained and strictly adhered to if more stringent. MRPL/PMC shall be the sole arbitrator in such instances.

Contractor shall visually check the equipment with manufacturers' test/inspection record but equipment shall normally not be opened unless there is clear evidence that an internal inspection is necessary.

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Contractor shall perform the coupling alignment between the equipment and driver. An inspection record shall be maintained and submitted by Contractor to MRPL/PMC

Suitable screens or protection guards shall be installed to all rotating equipment to which persons may be exposed to injury to the entire satisfaction of MRPL/PMC. This shall be done prior to starting the operation of such equipment.

## 8.7 SITE INSPECTION OF CIVIL MATERIALS

### 8.7.1 PILING RECORDS

Contractor shall supply pile-driving records in accordance with the Project Specification and relevant Civil Engineering Standard and Quality Control Procedures.

### 8.7.2 AGGREGATES OF CONCRETE AND REFRACTORY MATERIALS

MRPL/PMC prior to Work commencing shall approve all sources of cement, grout, aggregate, reinforcing steel and fire protection materials.

Prior to pouring any concrete, Contractor shall submit to MRPL/PMC test certificates for the cement, fine and coarse aggregate, reinforcing steel, bitumen, etc. Contractor shall arrange for concrete slump and cube strength tests throughout the construction period and up to Provisional Acceptance. All concrete mix designs are to be approved by MRPL/PMC prior to use.

Contractor shall be responsible for taking samples of materials used for refractory lining of flue ducts and fired heaters and for testing to ensure conformance to specification. Contractor shall test any pre-lined stacked ducts and heater sections (in a laboratory) prior to shipment. All testing shall be carried out by an independent laboratory. The MRPL/PMC shall approve test laboratory. Evidence of the satisfactory inspection of such materials shall be submitted to MRPL/PMC.

## 8.8 SITE INSPECTION OF ELECTRICAL EQUIPMENT

Site testing of Electrical Installation and Equipment shall be in strict accordance with the Project Specification and relevant Electrical Engineering Standards and Codes.



Contractor shall supply all necessary calibrated testing equipment and instruments.

All test results shall be recorded in an agreed format with MRPL/PMC. Certified copies (signed by a competent person approved by MRPL/PMC) of the record shall be forwarded to MRPL/PMC prior to energising an electrical system or any part of it.

MRPL/PMC shall witness all electrical system functional tests.

## 8.9 SITE INSPECTION OF INSTRUMENT EQUIPMENT

Site Installation, Inspection and Testing of Instruments shall be in strict accordance with the Project Specification and relevant Instrument Standards and Codes.

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Contractor shall provide all the necessary testing and calibration equipment, including an appropriate instrument test workshop at the Site. Contractor shall retain all records of calibration testing, including origin of the calibration.

Such documentation shall form a part of the Project Quality Control documentation to be submitted to MRPL/PMC.

All materials test results shall be recorded and Contractor upon Contract Completion shall forward copies to MRPL/PMC

MRPL/PMC shall witness all instrument loop system functional checks.

## 8.10 SITE INSPECTION OF FIRE PROTECTION EQUIPMENT

Contractor shall submit for MRPL/PMC's approval full Quality Assurance/Quality Control documentation to cover for the installation, inspection and testing of all fire and gas detection and protection systems.

Contractor shall provide to MRPL/PMC entire satisfaction, full and complete records of the testing of each element of the fire and gas detection and protection systems.

## 8.11 TANK TESTING AND CALIBRATION

Contractor shall submit tank erection, testing and calibration procedures for review and approval by MRPL/PMC

The procedures shall specifically address the following:

- Progressive Non-Destructive (NDT) examination procedures to ensure control of welding and welders, vacuum testing activities, dimensional control, etc., during construction.
- Availability, quality, use, storage, distribution and disposal of test water.
- Settlement monitoring during construction, hydro testing and up to Provisional Acceptance. At least eight reference points per tank shall be established and monitored.

Contractor shall engage an independent third party Non Destructive Testing Agency to monitor tank construction. MRPL/PMC shall approve the NDT agency prior to engagement by Contractor.

Under no circumstances shall seawater be used for the hydro testing of tanks.


Tank strapping tables to be provided by Contractor, shall be obtained by Contractor using the Electro-Ophthalmic Distance Ranging (EODR) method (Laser technique). Contractor shall provide these to the Tank Gauging System Vendor, for input to the tank gauging software. A recognized, independent Authority, previously approved by MRPL/PMC shall carry out the tank calibration. The engagement of such Authority by Contractor will be entirely at Contractor's own cost.

## 9 CONTRACT COMPLETION

### 9.1 DEFINITION AND SCOPE

Contractor shall develop a procedure which establishes the basis of a checklist of construction items that need to be satisfied by Contractor in order to achieve Contract Completion of a particular Unit or system of the Project.



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### 9.1.1 CONTRACT COMPLETION

Contract Completion of a Unit or an individual system of the Project occurs when it has been erected and the system's testing and inspection activities are completed in accordance with the Contract, together with complete QA/QC support documentation as required in the Project Specification.

Contract Completion Certification establishes that a system, part system, Unit or part Unit is in a fit state to progress to Pre-commissioning. This will be subject to minimal agreed extent of outstanding works and the availability of associated utilities, system and process and safety control which will allow Pre-commissioning to progress safely, with regard to personnel and equipment protection, and efficiently in terms of the pre-commissioning activities.

The extent of outstanding works at the time of Contract Completion Certification will be agreed on the basis of safety, quality and productivity for completion of the works by Contractor and impact on Pre-commissioning and Operational activities. MRPL/PMC shall be the final arbiter in regard to the agreement of the allowable extent of outstanding punch listing correction activities.

### 9.1.2 CONTRACTOR'S RESPONSIBILITY

System testing is part of Contractor's Scope of Work and includes all non- operating activities, such as adjustments, cold alignment checks, hydrostatic/pneumatic testing, flushing, blowing out and chemical cleaning, etc.

All utilities until Final Test Certificate except water for hydro testing and flushing shall be provided by Contractor.

In case of non-process parts of the Works (e.g. buildings), Contract Completion is the Ready-for-Use condition, as accepted by MRPL/PMC.

Vendor's proprietary equipment and Licensors usually require the inspection of certain equipment/facilities before their FTC. Contractor shall schedule those activities, which may have an impact upon Contract Completion, in such a way that they do not affect the Schedule.

### 9.1.3 PROCEDURES



Contractor shall provide a detailed procedure including forms, document flow, schedule, certification scheme and status monitoring method for attaining Contract Completion, this procedure shall be agreed upon with the MRPL/PMC well in advance of such activity.

This shall not, however, relieve Contractor of its responsibility for the completion of all such Work as required by the Project Specification and other Contract documents.

All pinnacle documents, forms and procedures required for Contract Completion shall be compiled in a system Completion Manual, which itself forms a part of the documentation which has to be submitted and approved by MRPL/PMC prior to the achievement of Contract Completion. All Quality Control support data to support this pinnacle data shall be filed in a separate Quality Control dossier for each system.

### 9.2 HANDOVER DOSSIER REQUIREMENTS

Contractor shall provide a single handover dossier for each Unit or system, which shall encompass all the requirements from construction and Pre- commissioning phases up to Final Test Certificate.

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Dossiers shall identify all of the component parts of the system, or any part system, and shall provide for cross referencing and checking to Quality Control Documentation by Pre-commissioning Engineers to establish a mechanical integrity of the system prior to commencement of Pre- commissioning activity.

Contractor shall compile its Unit or system dossier on an on-going basis and shall identify the number of test packs to be included in each Unit or system and how the status of each test pack will be tracked and progressed.

### 9.3 PUNCH LISTING

Contractor shall start preparing the required engineering discipline punch lists categorized into various disciplines for each Unit or system well in advance of the scheduled Contract Completion date of any Unit or system of the Project and shall submit these to MRPL/PMC. These punch lists shall cover all items, which have not yet been fully completed or are which deviate from the requirements of the Project Specification which require resolution prior to acceptance Contract Completion. These shall be broken down per Unit or system and are to be completed by Contractor in order to achieve Contract Completion. Contractor's electronic punch lists database shall be made available to MRPL/PMC.

MRPL/PMC reserves the right to add items to any engineering punch list up to Final Test Certificate.

MRPL/PMC will only consider a punch list item complete when the MRPL/PMC has certified the completion of all the individual items therein.

If, however, Contractor deems it reasonable to complete certain activities after Contract Completion, it shall attach a consolidated punch list of those open items to the Notice of Contract Completion. It is then at the discretion of the MRPL/PMC to accept (or not) Contract Completion of that system of the Project.

Contractor shall propose its procedure for identification of control of punch list items which it proposes shall be completed after Contract Completion.

Contractor before Final Test Certificate shall clear all outstanding punch list items.

### 9.4 NOTIFICATION OF COMPLETION

When Contractor considers that a Unit or system has reached the stage of Contract Completion it shall inform the MRPL/PMC in writing by means of 'Notice of Contract Completion' to which the consolidated punch list of all open items previously agreed by MRPL/PMC shall be attached.

Notice of Contract Completion shall be substantiated by complete documentation in accordance with all the requirements of the Quality Control dossier for the individual system.

### 9.5 MAINTENANCE COORDINATION

Contractor shall provide a Maintenance Coordinator to liaise directly with MRPL/PMC personnel on all aspects of the completed Work. The Maintenance Coordinator shall be provided from the first Unit or system FTC up to Provisional Acceptance.

Contractor's Maintenance Coordinator shall be available to provide assistance, guidance on maintenance manuals and spare parts. The Maintenance Coordinator shall be responsible for coordinating all activities of Contractor, to respond to the MRPL/PMC's request for assistance





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with respect to any breakdown repairs and communications on any Warranty requirements with Vendors until Provisional Acceptance of the Project.



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<b>A-1</b>	<b>REQUIREMENT DURING CONSTRUCTION</b>
<b>A-1.2</b>	<b>HSE MANAGEMENT</b>

## MRPL Marketing Infrastructure Project, Mangalore

**PROJECT :** Marketing Infrastructure Projects, MRPL

**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** Nauvata Engineering Pvt. Ltd.

**JOB NO. :** JBG20005

0	09-Mar-2021	Issued for Bid			
Rev. No.	Date	Description	Prepared By	Checked By	Approved By



**MANGALORE REFINERY AND PETROCHEMICALS LTD.**  
**CONTRACT WORKER'S SAFETY POLICY - REV.**

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## **MANGALORE REFINERY AND PETROCHEMICALS LTD.**

### **CONTRACT WORKER'S SAFETY POLICY**

#### **1. SCOPE :**

This policy is applicable to all the contractors and their employees working in MRPL. This is also applicable to sub-contractors, suppliers, vendors and visitors. All the contractors are required to ensure that they and their employees comply with relevant safety requirements as mentioned in this Safety Policy depending on the nature of work. This policy is not a substitute to the statutory rules and regulations and also the prevailing MRPL Safety Requirements. This is to further reinforce the existing Safety Standards in Refinery.

**2. REFERENCE :** This document should be read in conjunction with following :

- General Conditions of contract (GCC)
- Special Conditions of Contract (SCC)
- Job specifications

#### **3. SAFETY REQUIREMENTS FOR CONTRACTORS:**

-Contractor shall furnish Safety policy and Safety Manual of their Company and his track record in safety for past three years to the Engineer Incharge.

Contractor shall furnish details of their safety department with CVs of safety officers in his bid document to Engineer Incharge.

-The contractor MUST employ Qualified Safety Officers as per the table below, having about 5 years of relevant experience in chemical units or Petrochemical Plants or refineries, as per The Factories Act 1948 / Building and other construction workers (Regulation of Employment and conditions of service) Act 1996 and Central Rules 1998 / The Karnataka Factories Rules 1969. Contractor shall ensure that all his workmen are aware about the nature of risk involved in their work and have adequate training for carrying out their work safely. Such Safety Officers appointed shall be dedicated and responsible only for safety. They should not be given any other responsibility. The contractor and his sub-contractor, if any, shall comply with the instructions given by MRPL Engineer In- Charge or his authorized nominee regarding safety precautions, protective measures, house-keeping requirements etc. Engineer-In-Charge from MRPL shall have the right to stop the work of the contractor, if in his opinion, proceeding with the work will lead to an unsafe and dangerous condition. Engineer-In-Charge shall get the unsafe condition removed or provide protective equipment at the contractors cost, which ever is applicable.

**Table**

Max. no. of employees < 30	One discipline (Engr. / Supervisor) with safety experience can function as Safety Staff on part time basis.
No. of employees : 30 – 100	One Safety Supervisor on full time responsibility.
No. of employees : 101 – 250	For Manpower Supply – Oriented Maintenance contract – One Safety Supervisor on full time responsibility. For Service – Oriented Maintenance / Project contract One Safety Engineer on full time responsibility + One Safety Supervisor on full time responsibility
Upto 250 Persons deployed by him at site	Deploy one Safety Officer and additionally deploy Three Safety Supervisors
For 251 to 500 Persons	Two Safety Officers, Six Safety Supervisors and Ten Safety Stewards
For more than 500 persons	Three Safety Officers, Ten Safety Supervisors and Twenty Safety Stewards

**Qualification criteria of safety officer:**

BSc (Physics Chemistry only)/Diploma (Mech/Elect/Civil only) with post graduate Diploma in Industrial safety with min of 5 years experience in supervisory cadre.

OR

BE/BTech (Mechanical/Electrical/Civil only) with post graduate Diploma in Industrial safety with min of 2 years experience in supervisory cadre.

**Qualification criteria of safety supervisor:**

BSc (Physics Chemistry only)/Diploma (Mech/Elect/Civil only) with qualification in industrial safety with relevant experience.

**4. PERSONNEL :**

- Personnel / workmen (age 18 years & above) deployed at site should be physically / medically fit. Labours/workers shall not bring children/babies inside the refinery.

**SMOKING IS STRICTLY prohibited inside the refinery.**

- Contractors and their workmen should restrict their activities to the site allocated to them.

- All contract men shall wear IS make PPEs like gloves, goggles, face shields, full body safety harness, safety belt, Safety Helmets, Safety Shoes etc during the work. They will not be permitted

- to enter the Refinery without wearing Safety Helmet, Safety Goggles & Safety Shoes. Damaged PPEs shall be taken out from use and disposed off properly.
- The contractor shall ensure that their men do not tamper with the facilities in operation. They shall not operate any Valves/ Switches etc.
  - The contractor shall ensure that his workmen do not move around freely inside refinery premises other than the assigned place of work & also do not sleep anywhere (Below piperacks / equipments / trucks / etc.) inside refinery premises.
  - The personnel engaged by the Contractor shall maintain good conduct and discipline commensurate with Industrial standard. If in the opinion of the Engineer-in-charge any of the personnel have not maintained good conduct and discipline, the Contractor shall remove such personnel immediately from MRPL premises and provide alternate personnel.
  - The contractor Supervisors and Engineers must get themselves conversant with MRPL's Standard Operating Procedures (SOP), safety norms, Rules and Regulations that are in force. They must also be conversant with the MRPL's Emergency Procedures and Emergency telephone numbers and should ensure display of same at prominent place.
  - Special safety precautions to be taken by the contractor or their personnel working in an operating refinery are given below. The safety procedure may undergo a change from time to time, which will be intimated to the contractor to follow and implement them.
  - In addition to the following minimum safety requirements, the contractor must comply with the safety requirements, norms, rules and regulations as per the Factories Act 1948 and Karnataka Factories Rules 1969, OISD Guidelines 207 and other OISD standards / guidelines and Indian Standards.
  - The contractor must prepare a detailed "Safety Programme" and submit it to Engineer In-charge of MRPL immediately after the finalization of contract / placing of LOI / order. This will include Safety Policy, Safety Responsibilities at various levels, Formations of Safety Committees and meetings, Method statements, Job Safety Analysis (JSA), Safety inspections, various pre-inspection checklists, Safety manuals, Safety Audits, Emergency Plans, Safety procedures to be implemented for all the activities, deputation of Safety Officers, enforcement of safety practices.
  - Contractor shall devise a procedure on Accident Reporting. All accidents including Near Misses and property damages to be reported as per the MRPL's Accident Reporting Procedure in force. All Accidents including Near Misses to be communicated immediately to Engineer Incharge over



telephone / verbally / and later submit the accident report. All accidents must be investigated, classified, analysed & comply with the recommendations to avoid its recurrence. Monthly Accident statistics must be developed and circulated. Contractor shall maintain a register of all such accidents.

- During the mobilization, equipments, machines, tools, tackles etc. to be inspected at the site from where it is being mobilized. Damaged ones should be discarded and ensured not mobilized at MRPL site. The statutory checks, inspections and certification is carried out before mobilizing at MRPL site. Necessary repairs and maintenance to be carried out and equipment, machine, tools, tackles etc. is mobilized at MRPL site in working condition. The previous records of maintenance and the competent person's certificates to be made available during mobilization and submitted to MRPL Engineer Incharge. The equipments, machines, tools, tackles, etc to be tagged and mobilized.

- A Safety Committee must be formed to discuss accidents, Unsafe Acts and Unsafe conditions. This should be chaired by the High ranking Official / Site-In-Charge with equal participation both from supervisory and non-supervisory cadres of employees. Engineer In-Charge of MRPL also should be involved in such meetings as an observer. The frequency of meetings shall be once in a month minimum and actions taken to avoid recurrence of Nearmiss, Minor injuries etc.

Circular of the meeting must also be issued to MRPL Engineer Incharge at least one week in advance. Minutes of the meetings to be prepared on the same day and submitted on next day of the meeting.

The contractor shall take all safety precautions during the execution of awarded work and shall maintain and leave the site safe at all times. At the end of each working day and at all times when the work is temporarily, suspended, he shall ensure that all materials, equipment and facilities will not cause damage to existing property, personal injury or interfere with other works of the Refinery. The contractor shall comply with all applicable provisions of the safety regulations, clean up programme and other measures that are in force at the site.

- Safety Inspections of the site to be conducted daily and Safety Audits to be conducted once in three months by a team of Senior Officials of the contractor. Report on findings of such Audit to be submitted to the Engineer Incharge and compliance report of the suggestions on findings to be submitted weekly to Engineer Incharge.

Daily Safety Inspection of jobs and safety audit to be conducted every month and the report and protocol signed by all parties, Contractor's safety officers with signatures of Site Incharges of contractor shall be part of subsequent RA bill.

- Method statement along with Job Safety Analysis to be submitted at least 15 days in advance before starting of any activity.

Prior information of high risk jobs as planned shall be informed with short details of the work, job safety analysis report to the Engineer Incharge at least 48 hours before starting of such jobs.

High risk jobs like fabrication at height, lifting and shifting, erection of equipments etc shall be video recorded by the contractor.

- The contractor shall provide and maintain all lights, guards, fencing, warning sign, caution boards, other safety measures and provide for vigilance as and where necessary or as required by the Engineer-In-Charge or by any duly constituted authority for the protection of workers or for the safety of others. The caution boards shall also have appropriate symbols visible during night also.

- Adequate lighting facilities, including emergency lighting, such as floodlights, hand lights and area lighting shall be provided along with ELCBs by the contractor at the site of work with isolation switch known to all at site with proper display, storage area of materials and equipment and temporary access roads within his working area. The contractor shall obtain written approval of the Engineer-In-Charge to the lighting scheme and place of tapping prior to its installation.

Use of devices like Distress alarm system for all personnel entering into confined space to be mandatory. Biometric attendance of personnel entering confined space should be maintained.

Necessary Biometric punch machine to be arranged by the contractor at his own cost for this purpose. Staircases shall have temporary hand rail and guard till permanent handrails are fabricated and installed.

The contractor shall plan his operations so as to avoid interference with the other departmental works, other contractors or sub-contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the Department for safe and smooth working.

The contractor shall be held fully responsible for non-compliance of any of the safety measures, procedures and delays, implications, injuries, fatalities, property damage and environmental degradation and compensation arising out of such situations or incidents. The contractor should device a procedure to maintain head count of his personnel manually or with an installation of

punching machine at site and ensure evacuation of his personnel through defined emergency exit in case if situation demands and also during confined space entry.

- Smoking is prohibited in the Refinery / work site / offices.

Consumption of alcohol and any other intoxicating material shall be also treated as safety violation and heavy penalty shall be levied on the main contractor.

- Radiography source and also the Explosives used for controlled blasting will not be permitted to be stored at site. Detailed accident report with photographs to be submitted to factory manager and Engineer In-charge from MRPL immediately.

- Contractor's Vehicles/Engines and approved electrical / mechanical equipments & lifting tools / tackles, welding generator that are to be used inside refinery are to be certified by competent authority. Statutory checks are to be carried out and records are to be maintained by contractors to ensure healthiness. These certificates will be regularly checked by MRPL engineer in-charge.

- The Contractor shall ensure that all industrial consumables such as Oxygen, Acetylene, Argon, Nitrogen, welding electrodes etc. are approved by MRPL, tested and records maintained by the contractor as per Gas Cylinder Rules before they are used for the job. LPG for gas cutting purpose is not allowed.

- The Fire prevention / protection and safety equipments (including Personal Protective Equipments) should be certified by MRPL engineer in-charge.

#### **5. HEALTH AND HYGIENE :**

- Sufficient number of toilets shall be provided by the contractor for its workmen and hygiene standard should be maintained.

Contractor to ensure no water stagnation at site.

Potable water facility for all workers shall be provided and maintained by the contractor.

Inspection of drinking water, sanitation, shall be done by MRPL. Availability of dust masks shall be ensured by the contractor at site.

Contractor to maintain affordable hygienic canteen for the workers.

- The contractor must maintain record of medical examinations of its employees as per The Factories Act 1948 and The Karnataka Factories Rules, 1969 and The Building and other construction workers (Regulation of Employment and conditions of service) Act 1996 and Central Rules 1998. This will include eye test of crane operators, vehicle drivers and all others. Also

Fitness certificate by the Medical Officer for working at height to be produced for each employee requiring to work at height.

- Adequate means and personnel for rendering first aid should be readily available at site and during working hours at places where work is carried out.
- Medical aid for First-Aid should be available.
- First Aid kits or boxes, as appropriate, should be provided at the workplaces and on motor vehicles, cranes, etc. and be protected against contamination by dust, moisture, etc.
- When workers are employed underground or beneath structures or pits or other conditions in which they may need to be rescued, suitable rescue equipment like tripod with pulley and safety belt should be readily available at site at or near the work site along with trained rescue workers.

#### **6. VEHICLE MOVEMENT :**

- The contractor shall conduct his operation so as not to interfere with the use of existing roads at or near locations where the work is being performed.
- Speed limit inside the refinery is 16 KMPH which should be strictly followed. For heavy machinery like cranes / forklift / RMC trucks, etc. the speed limit is 5 KMPH maximum.
- Special precautionary measures should be taken during transportation of long sized cargo, route as defined should be followed and for safety of personnel (with proper escort) and damages to the facilities should be avoided. Procedure for vehicle entry and Speed limits in Refinery should be strictly followed. Vehicles and cargos passing through refinery should have PESO approved spark arrestor fitted.
- When interference to traffic is inevitable, notice of such shall be given to the Engineer- In-Charge of MRPL well in advance with the details of start of the work and time required, storage of materials, and details of the proposed methods of providing the required facilities for safe and continuous use of roads and obtain his clearance.
- The contractor shall exercise full care to ensure that no damage is caused by him or his workmen, during the operation, to the existing water supply, sewerage, power or telecommunication lines or any other services or works. The contractor shall be required to provide and erect before starting of the work, substantial barricades, guardrails and warning signs. He shall furnish, place and maintain adequate warning lights, signals etc, as required by the Engineer-In-Charge.
- Vehicles must have green red flags and whistles for the cleaner to guide driver. All vehicles entering MRPL premises shall have cleaner / helper.

- The vehicles must be maintained as per the preventive maintenance schedule of the manufacturer / supplier. Only Drivers that are trained in Defensive Driving shall be deployed inside Refinery.

- Vehicles to be inspected fortnightly by trained technicians as per the inspection checklist.

Pre-inspection checklist to be formed to that effect.

- All vehicles to bear a sticker. "If you notice this vehicle is over speeding then please inform on telephone no 08242882192 / 2191 / 2194 / 2771 / 2731".

- Tractors and trucks / cranes / forklift should not be used for transporting personnel.

- Every vehicle should have the contractor's name prominently displayed on Tractor Trolleys, trucks, jeeps, cranes, JCBs, Poclains, trailers. The display board should be put on front and rear side of each of the vehicle.

Tractor trolleys must have independent brake systems both on tractor as well as on trolleys.

- All vehicles must be fitted with PESO approved spark arrestors.

Tippers/trucks carrying debris and soil/mud/sand shall ensure that there is no spillage of material on road. If any such spillage observed the same need to be cleaned and cleared by the contractor immediately. Wheels of the trucks and vehicles shall be clean and free from mud.

- Contractor to maintain Inspection and maintenance logs for every vehicle.

- Any kind of repair work on contractor's vehicle is to be carried out only inside the work shop or designated place and not allowed inside the battery area or any where at on road or at site.

#### **7. SAFE MEANS OF ACCESS :**

- The contractor must possess adequate numbers of self retractable type fall arrestors (of different sizes viz. 6 m, 20m, 40m, and 60 m), Safety nets and Safety Belts (Full Body Safety Harness) (ISI approved).

- Adequate and safe means of access and exits shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevation shall not be permitted.

- Suitable scaffolds shall be provided for workmen for all works that cannot be done safely from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made of metal and all ladders shall be maintained well for safe working condition. If the ladder is used for carrying materials as well, suitable foot holds and handholds shall be provided on the ladder. Ladders shall not be used for climbing carrying materials in hands. While climbing both the

hands shall be free. Ensure positioning of person at base / grade level while it is in use. All ladders, platforms, full body safety harness and safety nets should be inspected regularly and records should be maintained. Damaged items shall immediately be taken out of service and disposed off.

- Scaffolding staging more than 1.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support and ladder shall conform to relevant IS specification. Timber bamboo scaffolding is not allowed inside the Refinery.

- Working platforms of scaffolds shall have toe boards 15cms in height to prevent materials from falling down.

- A sketch of the scaffolding proposed to be used shall be prepared and approval of the contractor's Mechanical Engineer obtained prior to start of erection of scaffolding. All scaffolds shall be examined and certified with proper display of tags by contractor's Mechanical Engineer before use.

- Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9m in length. For ladders upto 3m in length the width between side rails in the ladder shall in no case be less than 300mm. For longer ladders this width shall be increased by atleast 20mm for each additional metre of length. Step shall be uniform and shall not exceed 300mm.

- Working platform and gangway along the side of pipe racks shall be provided. Under no circumstance the contractor employees should step on pipes at pipe racks.

#### **8. EXCAVATION, TRENCHING AND EARTH REMOVAL :**

- A Work Permit must be taken for any excavation or earth removal inside the existing refinery premises from Engineer In-Charge MRPL, as the area of work has underground pipelines, cables etc.

- All trenches 1.2m or more in depth shall at times be supplied with at least one ladder for each spacing of 3.0m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1m above the surface of the ground.

- The sides of the trench which are 1.2m or more in depth shall be stepped back to give suitable slope (angle of repose) or securely held by timber bracing (i.e. shoring of the excavated trench or pit should be done), so as to avoid the danger of sides from collapsing. The excavated material shall not be placed within 2m of the edges of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances under-cutting shall be done.

- The contractor shall ensure the stability and safety of the excavation, adjacent structures, services and the works.
- Open excavations shall be fenced off by railing (ledger pipes) and warning signals installed at well-lit places so as to prevent persons falling into the excavations.
- All blasting operations shall be carried out on the basis of procedures approved by Inspector of explosives. All works in this connection shall be carried out as per IS code of practice. Barricades, Warning signs etc. shall be placed on the roads / open area, Prior approval of such operation shall be obtained from Engineer-In-Charge of works. The blasting procedure being followed by the contractor must be submitted with MRPL engineer in-charge.
- The contractor must submit the methodology, safety aspects, schedule, License and other relevant features of control blasting operations.
- Wherever manual removal of earth is involved, earth shall be removed from the top by maintaining the proper slope equal to the angle of re-pose of the earth. Manual removal of earth / lowering of person in a pit should be done with tripod and pulley besides use of Full body Safety Harness by person.
- Such work shall be constantly supervised by the contractor's responsible persons.

#### **9. DEMOLITION :**

Before any demolition work is commenced and also during the progress of the work :

- Proper approvals shall be taken from Engineer in-Charge MRPL before commencing demolition.
- Area around shall be barricaded with cautionary signs and posting of security guards or supervisors for preventing unauthorised entries of personnel.
- All roads and open area adjacent to the work site shall either be closed or suitably protected. Appropriate warning signs shall be displayed for cautioning approaching persons.
- No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.
- Entries to the demolition area shall be restricted to authorized persons only.

Contractor to place separate collection facility of waste like metal, on metal non degradable and bio degradable wastes and shall dispose to designated place daily basis.

Contractor shall be responsible to clear dry grass and wooden items etc from and around his working site/storage/fabrication yard etc to prevent any fire accidents.



#### **10. PERSONAL PROTECTIVE EQUIPMENTS :**

- All proper "ISI" marked Personal Protective Equipments (PPEs) as considered necessary by the Engineer-In-Charge shall be kept available by contractor for the use of the persons employed on the site and maintained in a condition suitable for immediate use. Also the contractor shall take adequate steps to ensure proper use of equipment by those concerned. The PPEs are to be provided by the contractor.
- All persons employed at Refinery shall use safety helmets, safety shoes and safety goggles as minimum safety gears. For other types of works, persons working in that area shall also use the required PPEs, as advised by the Engineer-In-Charge of MRPL.
- Workers employed on mixing asphaltic materials, cement and lime mortars shall use Gumboots, safety goggles, hand gloves and proper respirator.
- Persons engaged in welding and gas-cutting works shall use suitable welding face shields with welder's helmet. The persons assisting the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- Stonebreakers shall use protective goggles. They shall be seated at sufficiently safe intervals or distance.
- Persons engaged in or assisting in shot blasting (Sand blasting is prohibited) operations and cleaning the equipment after shot blasting shall use suitable gauntlets, overalls, dust mask, dust proof goggles, safety shoes and protective hood supplied with fresh air.
- All persons working with 3M lifeline and hook at height above ground or floor and exposed to risk of falling down shall use safety belts (Full Body Safety Harness with double life line and scaffolding hooks, ISI marked) which should be properly secured to solid object unless otherwise protected by cages, guard railings, etc. In places where the use of full body safety harness is impractical, suitable safety net of adequate strength fastened to substantial supports shall be employed under proper valid permit.
- When workers are employed in sewers and inside manholes, which are in use, the contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. The atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the confined space entry permit, availability of standby person at manhole must be ensured before the personnel are allowed to get into the man-holes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or

caution boards or barricade tape to prevent accidents. There shall be proper illumination in the night.

#### **11. PAINTING :**

- Respirators shall be provided by the contractor for use when paint is applied, safety of personnel in vicinity also should be considered while painting.
- Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the painters for decontamination at the cessation of work.
- All solvent-based paints, thinners shall be stored in separate well ventilated storage kept under proper surveillance.
- Smoking, open flames or sources of ignition / hot work shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national / regional language, "SMOKING / HOT WORK – STRICTLY PROHIBITED" shall be displayed in the vicinity where painting is in progress or where paints are stored. Symbols shall also be used for caution boards.
- Suitable IS marked First Aid Fire Fighting equipments shall be kept available at a place where flammable paints are stored, handled or used.
- When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. Workers shall wear suitable supplied air type breathing apparatus. Work shall be carried out under a valid work permit.
- Epoxy resins and their formations used for painting shall not be allowed to come in contact with the skin. The workers shall use PVC gloves and / suitable barrier creams.
- Adequate ventilation shall be provided especially when working with hot resin mixes.
- Increased personal hygiene shall be practiced to control inadvertent contact with the resin and eliminate its effects.
- Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.
- Care must be taken while carrying out painting inside confined space. There shall be safety devices to monitor the personnel working inside confined space like vessels during painting of internal surface. Suitable painting methods shall be adopted as specified elsewhere. It should not be clubbed with hot work and proper ventilation should be available to draw out the solvent vapours. Manual painting is to be adopted instead of spray painting.

## **12. LIFTING MACHINES TOOLS AND TACKLES :**

- Supplier's / Manufacturer's manual for operations / safety / periodical maintenance of all Cranes, winches, JCBs, Poclains, Excavators, Trucks, tractors, Vehicles, etc. MUST be made available at site from the moment it is brought at site and the same should be strictly adhere to.
  - Lifting machines, tools and tackles shall be of good mechanical construction, sound material, adequate strength, free from any defects and shall be kept in good working condition.
  - Lifting machines, tools, tackles, equipments etc. to have identification tags of steel plate of size 2"x 2" tied to it using steel wire of 4 mm size. The details like reference number, Safe Working Load (SWL), date of testing, next due date of testing, etc. to be punched on this plate.
  - Contractor must produce Competent Authority's (Authorised by The Directorate of Factories, Karnataka state) Certificate of testing in the prescribed form of Lifting Machines, Chains, ropes and lifting tackles well in advance. Only valid Lifting Machines, tools etc. to be used and to be re-certified before expiry of certificate. Also, these equipments will be inspected by Engineer In-Charge of MRPL as and when required. The same procedure is applicable for all other Electrical Equipments, tools, machines, D.G sets, compressors, etc.
- Lifting equipments for testing by competent authority to include JCB, Poclain, Excavators, etc.
- The ringer crane to be tested and certified every time by Competent Person it is dismantled and reassembled. This certification must also include stability of soil on which it is assembled.
- Use of Hydra is not permitted inside refinery/construction premises. Hydraulically jacked lifting machines to be used.
- Lifting machines, tools, tackles, equipments etc. to be inspected in addition to the Competent Authority's certification. This should be done fortnightly by experienced trained mechanical foreman and technicians and record of such inspection to be maintained.
  - Every rope and sling used in hoisting or lowering of materials or as a means of suspension shall be of good quality and adequate strength and free from any defect.
  - Every crane operator or lifting appliance operator shall have a driving License for Heavy Vehicle, proper physical fitness such as eye sight etc. and with adequate experience. No persons under the age of 21 years shall be in charge of any hoisting machine or give signal to operator of such machine.
  - In case of every lifting machine (and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or as means of suspensions) the safe working load shall be ascertained and clearly

marked. In case of a lifting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load.

- The contractor shall notify the safe working load of the machine to the Engineer-In- Charge whenever he brings any machinery to site for work and get it verified by the Engineer-In-Charge, supported by a valid test certificate by the competent person.

- Motors, gearing transmission, couplings, belts, chain drives and other moving parts of hoisting appliances shall be provided with adequate safeguards. Hoisting appliances shall be provided with such means as to reduce to the minimum risk of any part on a suspended load becoming accidentally displaced or lowered.

- The contractor must have a team of Experienced Mechanical Personnel (having minimum of 5 yrs. experience in carrying out safety inspection and testing of Lifting machines, Tools and Tackles etc.), to conduct periodical (Daily, fortnightly, monthly and quarterly) inspection and testing of Lifting machines, Tools and Tackles and to maintain its records.

- Crane shall not be used as hoist. In case cranes are used as hoist then factory Inspector's permission to be taken in advance and to be subject to biannual testing by competent person as required for hoist under Factories Act 1948. Also, the design of cage to be got approved by the competent person well in advance. Two ropes or chains to be provided to the cage, separately connected with the cage, suspended independently and capable of carrying the whole weight of the cage.

- Contractor to maintain operation, inspection and maintenance logs for every lifting equipment, tool and tackle.

### **13. TEMPORARY SHEDS :**

- Before erecting temporary shelters like sheds or tents anywhere at site, written permission of the concerned Engineer In-charge must be obtained.

- Temporary sheds for site office should be avoided. Instead contractor shall arrange for portal cabins for site office / stores.

- Temporary shed should not be erected using scaffolding pipes. The shed should be made of safe construction material.

- The temporary shed should be erected after proper designing following engineering design practices in conformance with normal safety standards to ensure the stability and safety.

- Temporary shed should bear the contractor's name.
- Temporary piping, hose connections and electrical wiring to these temporary sheds must be laid in such manner that they do not cause tripping, hitting or electrocution hazards.

#### 14. **ERECTION** :

- At the planning stage consideration should be given, by those responsible for the design, to the safety of the workers who will subsequently be employed in the erection of such structures. A detailed erection scheme / schedule shall be furnished well in advance for all the critical erections.
- Care should be exercised by design engineers and other professional persons, not to include anything in the design which would necessitate the use of unwarrantably dangerous structural procedures and undue hazards, which could be avoided by design modifications.
- Facilities should be included in the design for such work to be performed with the minimum risk.
- Detailed Safety Procedure should be submitted as a part of Heavy Equipment erection scheme. Heavy Equipment erection scheme must be submitted at least one month in advance.
- Erection engineer to conduct training on rigging before every heavy lift / erection for crane operator, foreman and riggers.
- Erection of structural platforms, gratings and hand rails to be done on priority. The procurement of gratings, structural members for hand rails to be done on priority.
- Prefabricated parts should be so designed and made that they can be safely transported and erected.
- As far as practicable the safety of prefabricated parts while erection should be ensured by appropriate means, such as provision and use of :
  - a) Ladders;
  - b) Gangways;
  - c) Fixed platforms;
  - d) Platforms, Buckets, boatswain's chairs, etc. suspended from lifting appliances;
  - e) Safety belts and lifelines; and
  - f) Safety nets or catch platforms.
- Ladders to be inspected fortnightly by experienced trained mechanical foreman and mechanical technicians and record of such inspection to be maintained.
- The boatswain's chairs/ platforms used in structural erection to be inspected and checked once in fortnight and record maintained.

- In addition to the conditions of stability of the part when erected, when necessary to prevent danger the design should explicitly take into account:
  - a) the conditions and methods of attachment in the operations of stripping, transport, storing and temporary support during erection; and
  - b) Methods for the provision of safeguards such as railings and working platforms, and, when necessary, for mounting them easily on prefabricated parts.
- The hooks and other devices incorporated in prefabricated parts that are required for lifting and transporting them should be so shaped, dimensioned and positioned as:
  - a) to withstand with a sufficient margin the stresses to which they are subjected; and
  - b) not set up in the part stresses that could cause failures, or stresses in the building not provided for in the plans.
- Prefabricated parts made of concrete should not be stripped before the concrete has set and hardened sufficiently to ensure the safety of the operation.
- Store places should be so constructed that:
  - a) There is no risk of prefabricated parts falling or overturning; and
  - b) Storage conditions generally ensure stability having regard to the method of storage and atmospheric conditions.
- Prefabricated parts made of concrete should not be erected before the concrete has set and hardened to the extent provided for in the plans.
- While they are being stored, transported, raised or set down, prefabricated parts should not be subjected to stresses prejudicial to their stability.
- Trailers only to be used for transportation of pipes. Crane to be used for erection at site.
- Every lifting appliance should :
  - a) be suitable for the operation; and
  - b) be approved by a competent person, or tested under a roof load 20 percent heavier than the heaviest prefabricated part.
  - c) Ringer mode of a heavy crane **MUST** be inspected, checked and certified by competent person every time it is dismantled and erected. The report must bear the stability of the soil on which it is erected.
- Lifting hooks should have the maximum permissible load marked on them.
- Tongs, clamps and other appliances for lifting prefabricated parts should :

- a) be of such shape and dimensions as to ensure a secure grip without damaging the part ; and
- b) be marked with the maximum permissible load in the most unfavourable lifting conditions.
- Prefabricated parts should be lifted by methods or appliances that prevent them from spinning accidentally.
- The temporary basket cages / Platforms / Buckets / boatswain's chairs, etc. used for lifting / working at height suspended from lifting appliances or suspended from structures or beams MUST be certified by competent person and provisions or conditions as stipulated during certification to be adhere to.
- While prefabricated parts are being lifted measures should be taken to prevent workers from being struck by objects falling from a height and area around such site should be barricaded with cautionary signs.
- When necessary to prevent danger, before they are raised from the ground, prefabricated parts should be provided with safety devices such as railings and working platforms to prevent falls of persons.
- If workers are exposed to danger when releasing prefabricated parts from lifting appliances, adequate safety measures should be taken.
- At workplaces adequate instructions should be given to the workers on the methods, arrangements and means required for the construction, storage, transport, lifting and erection of prefabricated parts.
- When it is not practicable to install protective guardrails and toe boards the workers should be provided with and use safety belts and lifelines to limit the height of the fall.
- Overhead screens to be provided to prevent workers from being struck by falling objects.
- The safety devices (guard-rails, toe-boards, safety belts and lifelines) should not be removed so long as the risk remains.
- Precautions should be taken to prevent fires being caused by rivet-heating equipment.
- Rivet heaters should extinguish their fires before leaving work.
- Extra care should be taken to prevent fall of objects, tools, etc. from height.
- Before structural steel parts are lifted, care should be taken that any object that could fall is fastened or removed.
- Structural steel parts should not be dragged while being lifted if that could cause danger.



- Steel trusses that are being erected should be adequately shored, braced or guyed until they are permanently secured in position.
- While structural members are being moved into place the load should not be released from the hoisting rope until the members are securely fastened in place.
- Structural members should not be forced into place by the hoisting machine while any worker is in such a position that he could be injured by the operation.
- No load should be placed on open-web steel joists until they have been placed in position and secured.
- Erection of pipes to be done using web belts only. Web belts must be inspected and checked fortnightly internally by the contractor and records maintained. Damaged ones to be cut to pieces and record to be maintained.
- Nipples and other accessories used for hydrotest and subject to high pressures to be inspected, checked and tested by experienced trained mechanical foreman and mechanical technicians and records maintained. Damaged parts to be replaced immediately with the new ones.
- Discarding criteria of web belts to be procured from the supplier / manufacturer by the contractor and submitted to MRPL Engineer Incharge.

#### **15. WORK ON TALL CHIMNEYS** :

##### **SCAFFOLDS** :

- All workmen should be certified medically fit by medical practitioner before working at height. Mock up drills MUST be conducted by the contractor for all these workmen and issue Working at Height passes to only those who has experience of working at height, is declared medically fit and shows confidence during mock up drills.
- For the erection and repair / painting of tall chimneys and vertical structures scaffolding should be provided. Scaffolds after erection should be certified by competent mechanical engineer for its strength before use and be displayed with a tag "Certified for use".
- Scaffolds should confirm to relevant Indian Standards: Contractor MUST have a team of trained scaffolders including trained Scaffolding engineer.
- Fixed inside scaffolding should be securely anchored in the chimney wall.
- The scaffold floor should always be at least 65 cm (26 in) below the top of the chimney.
- Under the working floor of the scaffolding the next lower floor should be left in position as a catch platform.

- Suspended outside platform (inspection scaffolds) should be provided as per the relevant standards as stated above.
- Use of Catch platforms, stairs, ladders and Iron rung, lifting tools, tackles and work with hot asphalt, tar should be carried out as per the procedures outlined in relevant ILO manual.
- Full Body Safety Harness (Safety Belt) with lifelines (of various sizes 2', 5' and 9' double lanyards) and safety nets being used should confirm to relevant standards and are to be inspected, tested, periodically and records be maintained. Damaged safety belts and nets should be discarded, taken out of service and disposed off.
- Safety belts must be used while working at height. The life lines (lanyard) MUST be tied to firm support. In case of absence of firm support provision of wire rope of adequate size tied with lifting tackles to be made to tie the safety belt life line (lanyard).
- All Safety belts to be inspected once in a month and damaged ones to be discarded. Suppliers / Manufacturers Discarding criteria of safety belts to be submitted to MRPL. The record of inspection and the results to be maintained. And a copy to be submitted to Engineer Incharge.
- The scaffolds to be inspected and certified by the competent mechanical Engineer before use and subsequently, at least once in a week.

#### **16. Safety of Electrical works:**

Before starting work in live electrical panels, proper electrical isolation shall be ensured. The same to be inspected by the electrical in charge and necessary isolation tag shall be attached. Proper electrical isolation permit system along with LOTO (Locking Out / Tagging Out) system shall be maintained by the contractor. Triplicate copy of such permits shall be submitted to MRPL.

#### **17. CATCH NETS :**

- Where workers cannot be protected against falls from heights by other means they should be protected by catch nets.
- Catch nets should be made of good quality fiber cordage, wire or woven fabric or material of equivalent strength and durability.
- The perimeter of catch nets should be reinforced with cloth-covered wire rope, manila rope or equivalent material.
- Catch nets should be provided with adequate means of attachment to anchorage.
- Catch nets to be inspected fortnightly, tested and records maintained. Damaged safety nets should be discarded and record maintained.

**18. PROTECTION AGAINST MOVING VEHICLES :**

Workers who are regularly exposed to danger from moving vehicles should wear;

- a) distinguishing clothing, preferably bright yellow or orange in colour; or
- b) devices of reflecting or otherwise conspicuously visible material.

Light Vehicle shall have reverse horn and Heavy Vehicles shall have trained helpers with whistle and red and green flags for directing the driver.

**19. HANDLING MATERIALS :**

- Mechanical means should be provided and used for lifting and carrying loads.
- Personnel should have knowledge of safe ways of material handling.

**20. STACKING AND PILING :**

- Materials and objects should be so stacked and unstacked that no person can be injured by materials or objects falling, rolling, overturning, falling apart or breaking.
- Area earmarked for stacking and piling should be barricaded and only authorised personnel be allowed to carry out stacking and piling jobs.
- Proper stacking and piling should be done as per the guidelines of ILO.

**21. WELDING AND GAS CUTTING :**

- Welding and gas cutting operations shall be done only by qualified and authorised persons and as per IS specification and code of practice.
- All the hoses used on compressed gas cylinders (Acetylene, Oxygen etc.) to be as per IS.
- Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of flammable / gaseous mixtures. Contractor shall continuously monitor the area with Explosimeter / H<sub>2</sub>S meters.
- Welding and gas cutting equipments including hoses and cables shall be maintained in good condition. It should be checked daily by the user and fortnightly by the supervisor and recorded.
- Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is done in elevated positions / on trenches / inside refinery units, precautions shall be taken to prevent sparks or hot metals falling on persons or flammable materials (Welding booths shall be constructed).
- Use of proper PPEs by personnel involved in Gas cutting / Electric Arc welding should be ensured. Use of Welders Helmet with face shield by the welders is a MUST.

- Fire extinguisher shall be available near the location of welding operations. Valid permit shall be obtained before flame cutting / welding is taken up & comply with all the permit requirements.
- Contact of personnel with the electrode or other live parts of electric welding equipment shall be avoided.
- Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
- The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that movement of materials does not damage the cables.
- Oxy-Acetylene cylinders must be mounted on trolley with chain holding the compressed gas cylinders. The compressed gas cylinders must have pressure gauges fitted over it and Oxy-Acetylene Gas cutting set should be fitted with flash back arrestor at both the torch and cylinder ends.
- Under no circumstance the compressed gas cylinder should be taken inside the confined space or excavated pits. Hydraulic test certificates of all compressed gas cylinders should be maintained and furnished as and when required.

## **22. GRINDING** :

- All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- Grinding wheels of specified diameter only shall be used on a grinder – portable or pedestal- in order not to exceed the prescribed peripheral speed.
- Helmet with face shield shall be used during grinding operation.

## **23. HOUSE KEEPING** :

- The contractor shall at times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment.
- Welding and other electrical cables shall be routed as to allow safe traffic by all concerned.
  - No materials on any of the sites of works shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Engineer-In-Charge may require the contractor to remove any materials which, are considered to be of danger or cause inconvenience to the public.
  - At the completion of the work, the contractor shall have removed from the work premises all scaffoldings, surplus materials, rubbish and all sheds and sanitary arrangements used / installed for his workmen on the site.

- House keeping of the workplace shall be done strictly by the Contractor on daily basis or as required by the Engineer-in-charge. Contractor to collect all debris/ scrap and dump at designated Scrap Yard as defined by MRPL authorities.
- A separate house keeping team to be formed and made available round the clock.

#### **24. FIRE SAFETY :**

- Adequate number of duly calibrated Explosimeters, Oxygen meters, Hydrogen Sulphide detectors (Portable / Fixed) or any other multiple gas detector should be made available at site by the contractor.
- Combustible materials like timber, bamboos, paints etc. shall not be used at MRPL site for scaffolding or for supports.

Containers of paints, thinners and allied materials shall be stored in a separate room, which shall be well ventilated, and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be covered or properly fitted with lid shall not be kept open except while using.

- Fire extinguishers as approved by Engineer-In-Charge shall be located at the work site at appropriate places.
- Adequate number of contract workmen shall be given education and training in fire fighting and extinguishing methods.

#### **25. WORK PERMIT SYSTEM :**

- MRPL's Work Permit system (As per MRPL Safety Manual) to be strictly followed.
  - All jobs within refinery should be executed with a safety work permit only. These will be issued by the concerned operating personnel of MRPL (Refinery Shift Manager or any authorised person). However, he can withdraw the permit when the stipulated conditions are not complied with at the work spot.
  - Area is safe for performing the Work. Job is continuously supervised by qualified supervisor.
- Responsibility of Performing Authority :**
- To obtain an approved Work Permit duly filled and signed by authorities as per the MRPL's Work Permit System before starting the work in the area.
- To visit job sites and ensure that it is prepared accordingly.

- The person performing the job shall be in possession of the permit till the completion of the job. The permit should be produced for inspection at any time. The Work Permit shall be displayed at job site in the plastic folder.
- To understand the scope of the work and implications involved.
- To restrict the work to the area / equipment specified in the work permit.
- To comply with the instructions given on the Work Permit.
- To follow Plant Safety Rules and Procedures.
- To be alert at all times for the development of unexpected situations.
- To stop the work immediately on detecting any unsafe condition and promptly inform the Issuing Authority. Follow MRPL's Onsite Disaster Management Plan (DMP).
- To return the Permit duly signed after completion of the job to the Issuing Authority. Contractor must adhere to work permit system and other safety regulations.

#### **26. WORK IN AND AROUND WATER BODIES:**

When the work is done near any place, where there is a risk of drowning, all necessary rescue equipment such as life buoys and life jackets shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work. Persons who do not know swimming shall not be engaged alone for any work where risk of drowning exists. Sufficient number of life buoys or life jackets shall be provided.

#### **27. PUBLIC PROTECTION :**

The contractor shall make all necessary provisions to protect the public. He shall be bound to bear the expenses for defense of every action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of any precaution required to be taken to protect the public. He shall pay the damage and cost which may be awarded in any such suit, action or proceedings to any such person, or the amount which may be fixed as a compromise by any such person.

#### **28. OTHER STATUTORY PROVISIONS :**

Notwithstanding the above clauses there is nothing in these to exempt the contractor from the provisions of any other Act or Rules or Indian Standards or OISD standards or OISD guidelines in force in the Republic of India. In particular all operations involving the transport, handling, storage and use of explosives shall be as per the standing instructions and conform with Indian Explosives

Act, 1884 and the explosives Rules, 1983. The Factories Act 1948 and The Karnataka Factories Rules, 1969, Handling, transport, storage and use of Compressed gas cylinders and Pressure vessels shall conform with the Gas Cylinders rules 1981 and Static and Mobile pressure Vessels (Unfired) Rules 1981. In addition, The Building and other construction workers (Regulation of Employment and conditions of service) Act 1996, The Indian Electricity Act, 1910 and Indian Electricity Rules 1956, The Atomic Energy Act 1962, The Radiation Protection Rules 1971, Radiation Protection Manual of Nuclear Facilities and the Atomic Energy (Factories) Rules 1988 and various rules and Act relevant to the activities being performed shall also be strictly complied with.

- No Child labour should be brought in for work.
- MRPL holds the right to issue warnings / Heavy penalties (monetary fine) / suspend work at any time or terminate the contract for a loss / damage and a pattern of frequent failure to adhere to Safety Laws, regulations and Onsite Safety procedures. In general a heavy monetary fine will be deducted straight from the contractor's bill for each violation of Safety Rules / Unsafe Act / Unsafe Condition observed, for each First-Aid injury, for each Lost Time injury / Near Miss Accident and for each fatality.

**29. GUIDELINES AND GENERAL PROCEDURES FOR SUPPLY AND USE OF, ELECTRICITY AT SITE :**

Following safety requirements shall be complied with before the contractor uses the power supply.

- The contractor shall submit a list of licensed electrical staff to be posted at site.
- It shall be the responsibility of the contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-In-Charge / Electrical Engineer.
  - (a) Indian Electricity Act, 1910
  - (b) Indian Electricity Rules, 1956
  - (c) National Electric code, 1985
  - (d) Other relevant rules of Local bodies and Electricity Boards.
- Where distribution boards are located at different places the contractor shall submit schematic drawing indicating all details like size of wires, overhead of cable feeders, earthing etc. The position and location of all equipment and switches be given.



- The contractor shall make his own arrangements for main earth electrode and tapings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant I.S. Specifications.
- Overhead High Tension (HT) cable routes to be marked and physically barricaded to prevent crane coming in contact with it.
- All three-phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.
- All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.
- Every electrically operated machine or equipment to be independently earthed.
- Earth pits to be provided near DG sets, electrically operated machines, equipments etc. DG sets used in Refinery shall be installed inside acoustic enclosure to minimise noise pollution. Exhaust of DG sets shall be routed to safe height.
- Continuity and resistance of all earth connections to be inspected and checked and tested fortnightly and records to be maintained.
- The contractor shall not connect any additional load without prior permission of Departmental Electrical Engineer.
- Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However, tapings from an earth bus may be done.
- The entire installation shall be subjected to the following tests before energisation of installation including portable equipment :
  - a) Insulation resistance test
  - b) Polarity test of switches
  - c) Earth continuity test
  - d) Earth electrode resistance
- The test procedures and their results shall conform to relevant IS specifications. The contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.

- Only persons having valid wireman's license shall be employed for carrying out electrical work and repair of electrical equipment installation and maintenance at site. The job shall be supervised by a qualified licensed supervisor.
- Electricians to be provided with red helmet for easy identification.
- Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant Indian Standards.
- The minimum clearance to be maintained for all overhead lines along roads and across roads shall be as per the statutory requirements.
- Grounding conductor of wiring system shall be of copper or other corrosion-resistant material. An extra grounding connection shall be made in appliances / equipment where chances of electric shock is high.
- Electric fuses and / or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses are used in all circuits. The Earth Leakage Circuit Breaker (ELCB) of 30mA max capacity shall be provided in the circuits. (ELCB) of 30mA max shall be provided on each Extension board.
- Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables / wire and earthed effectively. Metallic poles as a general rule, shall be avoided and if used shall be earthed individually. Anticlimbing guards and danger notices shall be provided on poles. Each equipment shall have individual isolating switches.
- Wires and cables shall be properly supported and an approved method of fixing shall be adopted. Loose hanging of wires and cables shall be avoided. Lighting and power circuits shall be kept distinct and separate.
- Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid underground, it shall be adequately protected by covering the same with

- bricks, Plain Cement Concrete (PCC) tile or any other approved means and provided with cable markers.
- All armored cables shall be properly terminated by using, suitable cable glands. Multistranded conductor cables shall be connected by using cable lugs/sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
  - All cable glands, armoring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.
  - All the Distribution Boards, switches, fuse units, bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and water proof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible, change shall be done only after the approval of the Departmental Electrical Engineer. Distribution Boards used inside the process units shall be of Flame Proof type (Intrinsically safe type).
  - Each Distribution Board shall have ELCB of 30mA max capacity.
  - The contractor shall provide proper enclosures / covers of approved size and shape for protection of all the switchboards, equipment etc. against rain. Exposed live parts of all electrical circuits and equipment shall be enclosed permanently. Crane trolley wires and other conductors which cannot be completely insulated shall be placed such that they are inaccessible under normal working conditions.
  - Iron soclad industrial type plug outlets are preferred for additional safety.
  - Open type Distribution Boards shall be placed only in dry and ventilated rooms; they shall not be placed in the process units, vicinity of storage batteries or otherwise exposed to chemical fumes.
  - Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.
  - In front of distribution boards a clear space of 90cm shall be maintained in order to have easy access during emergency.
  - Adequate working space shall be provided around electrical equipment, which require adjustment or examination during operation.

- As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in workroom where there is possibility of explosion hazard shall be explosion proof.
- All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed. Electric starter of motors, switches shall not be mounted on wooden boards. Only sheet mounting or iron framework shall be used.
- All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.
- Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections.
- Taped joints in the wires shall not be used. In case joints are required on electrical cables then only heat shrinkable PVC sleeves will be allowed.
- The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakages. Only 24V supply system shall be used for hand lamps etc. while working inside metallic tanks or conducting vessels(Confined spaces).
- After installation of new electric system and or other extensive extensions to existing installations, thorough inspection shall be made by Contractor's Electrical Engineer before the new system or new extension is put in use.
- All persons who work with electrical installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques, location of isolation switches, etc.
- The supervisor shall instruct the workers in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden ladders shall be used to reach the heights in electrical work.
- No material or earthwork shall be allowed to be dumped below or in the vicinity of the bare overhead line conductors.

- Separate work permits shall be issued for individual group leaders working on the same system which shall be returned after the completion of the work to the Engineer-In-Charge.
- Before any maintenance work is commenced on electrical installations/equipment, the circuits shall be de-energised and ascertained to be dead by positive test with an approved voltage testing device. Switches shall be tagged or the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects viz. LOTO system to be followed.
- That there shall be no danger from any adjacent live parts and
- That there shall be no chances of re-energisation of the equipments on which the persons are working. (Tag out and lock out LOTO system to be strictly followed).
- While working on or near a circuit, whenever possible the use of one hand may be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.
- When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not "freeze" to the conductor.
- Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet. Rubber mats should be placed in front of Panels / Distribution Boards as per Indian Standards.
- Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.
- When two persons are working within reach of each other, they shall never work on different phases of the supply.
- When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment / circuit.
- It shall be ensured that the insulation and wire size of extension cords is adequate for the voltage and current to be carried.
- While tapping electricity from the socket, plug top must be used. It shall be ensured that no extension boards are over loaded while tapping. Only standard three pin plugs (Naked Wire is prohibited ) shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with good ones. Only joint free cables shall be used for connecting equipment/Use of apparatus.
- Floors shall be kept free from trailing electrical cables to avoid tripping hazard.

- Power supply to all the machines and lighting fixture shall be switched off when not in use.
- Temporary electrical connections shall be removed as soon as the stipulated work is over. After completion of the works, the contractor shall dismantle the distribution boards and the other facilities he may have erected.
- Unauthorised tapping of power by others from distribution boards under the control of the contractor shall be prohibited at all circumstances.
- No flammable materials shall be stored in any working area near the switchboards.
- Safety work permits shall be used for switching off the main feeder and equipment by the contractor.
- "MEN ON LINE" "DO NOT SWITCH ON" "DANGER" or "CAUTION" boards as applicable shall be used during maintenance works on the electrical equipment.

### **30. PORTABLE ELECTRICAL EQUIPMENT :**

- Portable electrical tools must be examined, maintained and tested daily, fortnightly and quarterly so that the equipment and its leads are in good order. Register shall be maintained for inspection recording the testing dates and results of the equipments. Inspection checklists to be formed to that effect. The recertification of lifting tools, tackles, equipments etc. must be carried out well before the expiry of its validity period.
- All portable appliances shall be provided with three core cable and three pin plugs. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.
- All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wire in one length. No joints shall be allowed in this flexible wire. In case length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch, socket and ELCB of 30mA max..
- Flexible cables for portable lamps, tools and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.
- For excavations, one time clearance from electrical is required for a particular area.
- Contractor shall get their welding machine / Stress Relieving (SR) electrical equipment / all

- portable machine certified by MRPL / MRPL authorised contractor and seal will be fixed on machine to that effect. Certificate from third party mentioning the checks carried out, repairs carried out and safe to use to be submitted to Engineer Incharge.
- Revalidation to be done once in 4 months. In case contractor does not comply, it will be done by MRPL and four times the cost of repair will be back charged to contractor.
- In case of welding, separate return cable from job piece to welding machine to be connected. Wires not to be used. PVC insulated cables only to be used.
  - All lighting circuits/temporary connections for portable machine should have ELCB's of 30mA capacity max.
  - All ELCBs to be tested once in 15 days using ELCB testers (and not by the lamp with open wires) and record maintained. Also separate register for ELCB trips (TRIP REGISTER) shall be maintained. It shall be daily signed by the site Incharge of the contractor.
  - Earthing of Neutral, which will act as return path, is not allowed.
  - Electricians should have wireman license.
  - During monsoons, monsoon protection for electrical equipment to be done.
  - All feeders in contractor distribution panel to be clearly lettered with load details for isolation in case of emergency.
  - Insulated tools like screwdriver, cutting plier, tester to be used.
  - Each contractor should have one set of multimeter, ELCB tester and tong tester.
  - First aid kit to be available.
  - The contractor must have a team of Experienced Electricians (having minimum of 10 yrs. experience in carrying out safety inspection and testing of Electrical Equipments, tools, portable electrical machines and appliances etc.). to conduct periodical (Daily, fortnightly, monthly and quarterly) inspection and testing of Electrical Equipments, tools and portable electrical machines, tools and appliances and to maintain its records.
  - All power cable ends should have industrial plug on one side and other end directly into the machine. (No naked end pinning into will be permitted).
  - For any job within MCC / SRR a work permit will be issued by MRPL operation. Job should not be started without these permits.



### **31. ROLE OF CONTRACTOR INCASE OF EMERGENCY AND SIREN :**

- Contractor shall instruct his workers to follow instructions strictly in case of fire siren / emergency or if advised or felt necessary by Engg. In-charge. If evacuation is ordered they must leave the work site and proceed towards the nearest designated assembly point. The contractor and its employees MUST follow specific instructions (Roles and Responsibilities incase of fire / onsite emergency) that will be given during training from time to time. All contractor employees MUST undergo such training, before their deployment at the work site. Contractor shall arrange & conduct such trainings for his employees and also employees of sub-contractors.
- Contractor shall instruct his workers to stop all jobs immediately incase release of liquid/gas/toxic/hazardous chemicals etc, and inform the concerned MRPL personnel available at site.

### **32. TRAINING :**

- The contractor to conduct Induction training of all employees and record maintained.
- The contractor will have to depute all his employees (including Engineers, supervisors and workmen), before they commence work for the first time at MRPL site and subsequently once in a year, to undergo Safety training. They will get photo gate passes only after the completion of the training. Contractors MUST have and get conversant with Material Safety Data Sheets of all the Chemicals in MRPL. It is a MUST for them to carry the photo passes with them and produce it when demanded at site.
- Tool box talks to be conducted every day before starting of each shift and before commencing of work after lunch break by the concerned Engineer.

### **33. LIST OF PERSONAL PROTECTIVE EQUIPMENTS**

The contractor must poses the following minimum safety Items cum Personal Protective Equipments. All Personal Protective Equipments used at site to be of approved make.

### **34. MANDATORY FOR THE CONTRACTOR EMPLOYEES WHILE WORKING INSIDE REFINERY :**

\* Deployment of adequate nos. of safety officers as per table above and making available the mandatory items as per the minimum list below is a MUST as a part of mobilization activity.

1. Safety Helmet.
2. Safety shoes (Conforming to IS standards with ankle protection, steel toe and anti-skid / acid, alkali and water proof soles).

3. Hand gloves (Leather impregnated cotton hand gloves).
4. Spectacle type goggles with toughened glass lenses, plain face shields with and without chin guards.

The contractor must use the "ISI" marked Personal Protective Equipments specific to the job . It is mandatory to have minimum backup stock of all the PPEs in addition to what is already in use at site.

### **35. SPECIFICATIONS FOR SAFETY HELMETS-HDPE.**

- 1) Helmet Safety Industrial HDPE white colour.
- 2) Contractor's Logo at front side.
- 3) Conforming to IS 2925, ISI marked & DGMS approved.
- 4) Nape strap type adj. type 6 point adj. head band & sweat band with 3/4" Cotton Chin strap.

\* Green helmets for Safety Personnel and Red helmets for electricians to be provided and used by them.

### **36. SPECIFICATION FOR FULL BODY SAFETY HARNESS) SAFETY BELT**

Full Body Safety Harness (Safety belts) must be double lanyard type with scaffolding hook having self closing latch (spring type).

Different type of hooks to be available based on the nature of job / type of support. Safety belts should be ISI marked and should conform to IS 3521 and DGMS approved and stamped.

Safety belts, safety straps, lifelines, permanent anchors and connections should both separately and when assembled :

- a) be capable of supporting safely a suspended load of at least 450 kg (1,000 lb) ; and
- b) have a breaking strength of at least 1,150 kg (2,500 lb).

If hooks are used for attaching safety belts to fixed anchors, they should be self closing safety hooks of various types and sizes.

When a lifeline or safety strap is liable to be served, cut, abraded or burned, it should consist of a wire rope or a wire-cored fiber rope.

Safety straps should be so fastened to safety belts that they cannot pass through the belt fittings if either end comes loose from its anchorage.

Metal thimbles should be used for connecting ropes or straps to eyes, rings and snaps. Safety belts, safety straps and lifelines should be so fitted as to limit the free fall of the wearer to 1m (3ft 3in).

**37. SPECIFICATION FOR FALL ARRESSTOR DEVICE**

Fall arresstor device with self-retracting cable integrating locking mechanism combined with an energy deception element fully automatic having cables of various lengths, ISI and DGMS and or any international approval. Only Poly Amide rope shall be used.

**38. SPECIFICATION FOR DUST MASK**

Dust Mask made of superior quality non-aging chemical-resistant rubber half face piece with reflex sealing flaps for protection against nuisance dust, (<0.5 micron) toxic dusts, gases and vapours with replaceable filters.

**39. SPECIFICATION FOR REPLACEABLE FILTERS**

For protection against nuisance dust, toxic dusts, gases and vapours upto a concentration of 500 ppm. To be fitted on aforesaid Dust Mask.

**40. SPECIFICATION FOR SAFETY SHOES**

1. Safety Shoes, Jodhpury style- as per is 11226- 1985 with guarantee for 1& 1/2 years (all weather).
2. Acid/ alkali/ waterproof heat resistant, antiskid green PVC Nitrile sole.
3. Steel toe cap as per relevant "IS".
4. Upper plain leather, high ankle, with metallic 4 eyelets.
5. ISI marked.
6. The supplier should give guarantee of use of safety shoes during rainy season.

**41. STANDARD SPECIFICATION FOR PVC HAND GLOVES**

Hand contoured for greater comfort & feature an embossed nonslip grip for handling wet or greasy objects cotton flock lining absorbs perspiration maximises easy on/off black with straight cuff each pair pack.

**42. SPECIFICATION FOR ELECTRICAL PPE (SHOCK PROOF)**

Hand gloves used for live electrical works shall be of proper electrical rating.

Electrical (shoek proof) Safety Shoes (Jodhpury type) with acid/ alkali/ water proof, heat resistant, antiskid sole with guarantee for 1&1/2 years (all weather).

1. Upper plain leather.
2. ISI marked & latest certificate of testing from any of the govt. recognised institution for electrical resistance.

GUMBOOTS with steel toe should be used by personnel during rainy season.  
The aforesaid guidelines are the minimum safety requirements and the contractor should exceed them so as to achieve "ZERO ACCIDENT" which is our MOTO.

**43. TYPE SAFETY VIOLATIONS AND PENALTY SYSTEM:**

All the contractors working for MRPL shall strictly follow the safety norms as per the rules and regulations of MRPL. Contractors who violate safety norms while executing the jobs will be penalized financially.

The details of penalty amount against each safety violations is enclosed as Annexure-B.

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## Annexure B

SL no	Type of Safety Violations	Amended New penalty
1	No Lost Time Incident (NLTi) - Reporting back to duty within 48 hrs	First occasion Rs2500/- Second occasion Rs 5000/- Third occasion Rs 10000/- In addition to other expenses borne by contractor towards treatment. Existing Policy : none
2	Reportable Lost Time Incident (RLTI)- No reporting to duty within 48 hrs	First occasion Rs10000/- Second occasion Rs 25000/- Third occasion Rs 50000/- In addition to other expenses borne by contractor towards treatment. Existing Policy : none
3	Disability	Rs. 1,50,000/- per person Existing Policy : none
4	Fatal	Rs. 5,00,000/- per person Existing Policy : none
5	Vehicle Accident -Vehicle damaging Property or Vehicle to Vehicle Accident.	Rs 25000/- and Repairs/damage/restoration Existing Policy : none
6	For not using Personal Protective Equipment like (Safety Helmet, Safety Goggles, Safety Shoes, Hand gloves, Boiler suit, etc)	Rs. 500/- Per day / per item / per person for first violation. Rs. 1000/- for second onwards.
7	Working without permit / Clearance (Cold Work)	Rs.5,000/- per occasion After 3 violations, holiday listing for 6 months.
8	Hot work without proper permit / Clearance	Rs. 10,000/- per occasion. After 3 violations, holiday listing for 6 months.
9	Non-use of safe electricity at work site (non installation of ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire / cables on the roads, etc.	Rs. 3,000/ per item
10	Working at heights without safety belt (Full Body Safety Harness), using non-standard scaffolding and not arranging fall protection arrangement as required.	First occasion Rs2500/- Second occasion Rs 5000/- Third occasion Rs 10000/- After three occasions, holiday listing for 6 months.
11	Unsafe handling of compressed gas cylinders (No trolley, jubilee clips, double gauge regulator, Improper storage / handling).	Rs 500/- per occasion.
12	Non fencing / barricading of excavated	Rs. 1,000/- per occasion.

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	areas,	
13	Use of domestic/commercial LPG cylinder for cutting purpose	Rs. 1,000/- per occasion.
14	Non-display of name board, permit, etc. at site.	Rs. 500/- per occasion.
15	Not providing shoring / strutting / proper slope and not keeping the excavated earth at least 1.5 m away from the excavated area.	Rs. 2000/- per occasion.
16	Wrong parking of vehicles or parking the vehicles at non-designated places inside refinery.	Rs. 1,000/- per occasion.
17	Absence of contractor representative in refinery safety meetings whenever called.	Rs. 3,000/- per meeting.
18	Non-deployment of safety supervisor / supervisor responsible for safety at work site required as per Special Safety Conditions.	Rs. 3,000/- per day.
19	Failure to maintain safety register and records by contract Safety Supervisor or the Supervisor responsible for safety.	Rs. 1,000/- per day
20	Failure to have daily safety site inspection / audits, monthly safety meetings and maintain records (by contractors themselves).	Rs. 1,000/- for each occasion
21	Failure to submit monthly safety report by the 5 <sup>th</sup> of the next month to the Engineer - in - Charge.	Rs. 1,000/- per occasion
22	Poor Housekeeping.	Rs. 1,000/- per site / per day.
23	Failure to follow injury reporting system.	Rs. 10,000/- per occasion.
24	Violation of safety condition as per Job Safety Analysis (JSA)	Rs. 10,000/- per Occasion
25	Over-speeding of vehicle i.e speed > 16 KMPH while driving inside refinery.	<ol style="list-style-type: none"> <li>1. The driver will be removed and gate pass will be withdrawn.</li> <li>2. Contract will be cancelled upon repeated three violations.</li> </ol>
26	Overtaking of vehicles while driving inside refinery.	<ol style="list-style-type: none"> <li>1. The driver will be removed and gate pass will be withdrawn.</li> <li>2. Contract will be cancelled upon repeated three violations.</li> </ol>

WHS  
27/10/19

27	Driving of vehicle without valid license.	First occasion Rs1000/- Second occasion Rs 2000/-  1. The driver will be removed and gate pass will be withdrawn. 2. Contract will be cancelled upon repeated three violations.
28	Driving vehicle without PPSO approved or PPSO approved but damaged spark arrester.	1. The driver will be removed and gate pass will be withdrawn. 2. Contract will be cancelled upon repeated three violations.
29	Driving vehicle on "NO ENTRY ROADS".	1. The driver will be removed and gate pass will be withdrawn. 2. Contract will be cancelled upon repeated three violations.
30	Denying to produce the photo Gate Pass on demand.	1. Rs.500/- per person per occasion
31	Contract worker found drunk/intoxicated state inside the refinery	1. Rs.15000 / - per person per occasion.

*Handwritten signature*  
17/10/19





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<b>A-1</b>	<b>REQUIREMENT DURING CONSTRUCTION</b>
<b>A-1.3</b>	<b>CONSTRUCTION QUALITY MANAGEMENT AND QUALITY CONTROL</b>

### MRPL Marketing Infrastructure Project, Mangalore



**PROJECT :** Marketing Infrastructure Projects, MRPL

**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** Nauvata Engineering Pvt. Ltd.

**JOB NO. :** JBG20005

0	09-Mar-2021	Issued for Bid	JT	ASN	ASN
Rev. No.	Date	Description	Prepared By	Checked By	Approved By



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- I. ATTACHMENT – I : INDICATIVE INSPECTION & TEST PLAN FOR CIVIL & STRUCTURAL WORKS
- II. ATTACHMENT – II : INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS
- III. ATTACHMENT – III : INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS
- IV. ATTACHMENT – IV : INDICATIVE INSPECTION & TEST PLAN FOR ELECTRICAL WORKS
- V. ATTACHMENT – V : INDICATIVE INSPECTION & TEST PLAN FOR PAINTING WORKS:
- VI. ATTACHMENT – VI : INDICATIVE INSPECTION & TEST PLAN FOR INSULATION WORKS

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## 1. PURPOSE

This document is for understanding and implementation of quality management and quality control by CONTRACTOR to produce the product by combination of various activities and role of OWNER/PMC in verification during Construction.

The management of quality shall also cover co-ordination, review, approval audit and proper documentation of the works performed. Visual Inspection and Test Plans (ITP's) are forming part of this document as attachments.

## 2. SCOPE

The document shall be applicable for all construction works to be executed by CONTRACTOR's as well as OWNER/PMC for achieving overall objective of quality of various activities during construction.

## 3. RESPONSIBILITY

It is CONTRACTOR's prime responsibility to arrange / produce the product conforming to contract specifications and inspect all equipment, materials and works at various stages of execution as per the approved QA Plans.

In addition, they are to coordinate all efforts in this regard directly with the OWNER/PMC and other involved agencies to give adequate confidence that the activities have been performed as per agreed ITPs and necessary documentation are available. Verification and /or Approvals by OWNER/PMC at any stage shall not relieve CONTRACTOR of his responsibility for the quality of the product.



## 4. METHODOLOGY

The management of construction quality control is divided into the following categories:

- Procurement of materials required for the construction works.
- Execution of works.
- Documentation.

## 5. PROCUREMENT OF MATERIALS REQUIRED FOR EXECUTION OF WORKS

The CONTRACTOR shall develop list (s) defining the items to be procured by the CONTRACTOR along with likely vendors for approval of OWNER/PMC. The list of these items shall comprise of all the items necessary for execution & completion of construction works except the items like vessels, equipment, pumps, electrical panels etc. that may be available directly or requiring small fabrication as per requirement like bolts, nuts. The vendor list shall be in line with the contract document. In case vendor list is not available in the contract for a particular item, the CONTRACTOR can propose list of vendors. CONTRACTOR has to satisfy himself with the capacity of the vendor to deliver the product in time with quality. CONTRACTOR shall submit the QA/QC plans for all major items and carry out their procurement in line with approved plans. The CONTRACTOR can either provide his own adequate qualified staff for inspection or employ a separate third-party inspection. Involvement of OWNER/PMC in the quality control plan if required, shall be defined during approval of the same.

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## 6. EXECUTION OF WORKS

**6.1** The QA plans for execution shall be developed by the CONTRACTOR well before start of the works and OWNER/PMC approval shall be taken. The final inspection & Test Plans (ITP's) on the lines of indicative ITPs enclosed, as attachments shall be developed by CONTRACTOR as per contract specs for approval by OWNER/PMC. The activities that are identified as witness or Hold point, specific inspection call shall be raised by CONTRACTOR with OWNER/PMC in the requisite format well before time. It is intended that the CONTRACTOR shall be completely responsible for management of approved quality plans and OWNER/PMC involvement will be only of surveillance in nature to check at selective /critical junctures. Their role shall be to monitor that the CONTRACTOR is executing the quality plans as per the approved drawings employing adequately qualified staff and other resources for various items of works. Any deviation to the specification shall be brought to the notice of OWNER/PMC in proper formats by CONTRACTOR for approval.



**6.2** It is likely that the CONTRACTOR may engage SUB-CONTRACTOR(s)/vendors for performance of the work. CONTRACTOR shall be responsible for ensuring the implementation of approved QA plan, contract specifications and contract conditions through their SUB-CONTRACTOR's to achieve the quality during all stages of construction. It shall be the responsibility of the CONTRACTOR to ensure proper co-ordination between his sub- CONTRACTOR(s), vendor(s) and other agencies. The SUB-CONTRACTOR(s)/vendors selection shall be done after evaluation by the CONTRACTOR in line with contract requirements and shall be got approved by OWNER/PMC before engaging for the works.

### 6.3 SOURCE SELECTION /VENDOR APPROVAL

**6.3.1** For all the material which are naturally available and which will be used in the respective works shall be identified and approved by OWNER/PMC on the request of the CONTRACTOR. The source(s) shall be capable of giving good quality materials meeting to the requirement of Contract document and various relevant code/ standards and supplying without interruption of the entire quantity required for the works. After the source(s) are identified the samples shall be collected and the same shall be got tested in a reputed laboratory. The test results shall be reviewed and approved. Only after getting the approval for the source / vendor, material shall be brought to the work site. Without approval of the source/ material/ vendor, the same shall not be procured by the CONTRACTOR.

**6.3.2** Other materials preferably shall be bought from approved vendors given in the contract only. If there is change from the approved vendor list given in the contract, specific approval from OWNER/ PMC shall be taken in the format.

In case for the bought out items where approved vendors are not given and which are readily available in market, reputed vendors/brand/product shall be identified by CONTRACTOR and approval for the same shall be taken before hand from OWNER/PMC. Wherever the case demands samples of manufacturer's products shall also be produced for inspection and approval by OWNER/PMC.

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## 6.4 STORAGE


- 6.4.1** All the material shall be stored/stacked as per the standard norms specified by the supplier/ manufacturer and/ or as recommended in various clauses of relevant I.S. and contract document. The storage of material shall be such as to avoid damage to life/properties (physical and chemical) of the material and impact on environment. The storage shall not cause deterioration, rusting, mix-up etc. and hamper the other related works. The colour coding and markings shall be provided by CONTRACTOR for piping and other fittings. PMI for alloy steel materials shall be done on receipt at stores. CONTRACTOR shall submit his detailed warehouse plan for OWNER/PMC approval to manage the above in open/covered areas.
- 6.4.2** The cement bags shall be stored in a leak proof room with minimum openings. The bags shall be kept sufficiently away from the wall and some gap shall be maintained from floor to keep the moisture away from it. Not more than 10 cement bags shall be kept one above another. The bags, which have hardened, shall be rejected and removed from godown/stores.
- 6.4.3** Reinforcement steel, structural steel, piping materials, cable drums etc shall be kept in a separate yard. Wooden/Concrete sleeper support shall be provided below structural steel members and also for piping materials.
- 6.4.4** Aggregates shall be stacked separately to avoid intermixing of different sizes and to allow proper drainage of water.
- 6.4.5** Chemicals for anti-termite treatment shall be kept separately.
- 6.4.6** The materials susceptible to fire shall be kept away in a separate protected place.
- 6.4.7** In general, the materials shall be kept systematically in order of the class, batch number and identification number, so that it is accessible to the inspection by OWNER/PMC as well as the mix up in those materials avoided in all cases.
- 6.4.8** Materials with expire date, if any, shall be disposed-off after the due date. The disposal of expired materials shall be done as per the manufacturer's instructions and/or as per local rules & regulations /standards.

## 6.5 USE

- 6.5.1** The material shall be stacked in such a way that the lot, which is procured, first will be consumed first. No material beyond its expiry date shall be used. If any material expiry date has elapsed or its properties have changed, it shall be removed from site or wherever there is any doubt, with the consent of PMC/OWNER it shall be sent to a reputed approved laboratory for testing and acceptance.

## 6.6 INSPECTION

- 6.6.1** Before collecting the samples of naturally available materials the sources shall be identified by CONTRACTOR and on their request inspected by Engineer - in - charge or his representative team. The samples shall be collected in good clean bags, containers etc in sufficient quantities, sealed and sent to reputed approved laboratory for testing.
- 6.6.2** The testing, selection of source/vendor/brand for each material shall be done as per relevant code. Frequency of testing during the course of the work shall be identified and documented as per specs/code and strictly adhered.

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- 6.6.3** If any of the test is done in the field laboratories, the entire stage of testing shall be done in presence of CONTRACTOR's representative and test results shall be reviewed by PMC/OWNER.
- 6.6.4** The frequency and type of tests listed out in various specs are the minimum for which the material shall be tested. However, if at any time OWNER/PMC feels that the quality of any particular lot of material is not good or deteriorated, the same material shall be sent for testing as directed by OWNER/PMC. Until such time the result comes and duly reviewed, that particular lot of material shall not be used in works. The cost of tests shall be borne by CONTRACTOR. In case of any defect/discrepancy is observed in the materials, the CONTRACTOR has to replace the same with a good one without any financial implications.
- 6.6.5** As and when asked by OWNER/PMC the CONTRACTOR shall arrange at their own cost for witnessing the testing process of the materials, which are being sent to the reputed outside laboratories approved by OWNER/PMC.
- 6.6.6** OWNER/PMC shall at any time inspect the storage yard of different materials. As and when required, OWNER/PMC reserves the right to check the store records.
- 6.6.7** All the bought out items, which are accompanied with manufacturer's test certificate (MTC), OWNER/PMC shall check at any time for the co-relation of lot/ heat/ Identification No. as shown in the MTC and as marked over the materials. Records of supplier, total quantity supplied etc shall be maintained for review by PMC/OWNER. In case it is not possible to co- relate the material with MTC, challan etc. to the satisfaction of Engineer-in-charge, tests as per relevant codes shall be arranged by CONTRACTOR at his own cost as per defined frequency for acceptance of material.
- 6.6.8** Wherever MTC is required it should cover all the properties of the materials, validity and/or expiry date (if applicable) in accordance with relevant Codes/Specifications.
- 6.6.9** CONTRACTOR shall prepare MRR (material receipt report) of each material. It shall also include any third party inspection report on behalf of CONTRACTOR, supplier's name, total quantity received, date of receipt, expiry date site inspection report covering physical verification of quantity and quality and acceptance thereof.
- 6.6.10** All MRR (material receipt report), MTC (material test certificates), test results shall be reviewed by CONTRACTOR first and then offered to OWNER/PMC for final review and acceptance along with its copies.

## **6.7 IN PROCESS AND FINAL INSPECTION**

- 6.7.1** CONTRACTOR shall be responsible to arrange verification of product during in process and final inspection. Relevant checks and tests shall be arranged for the works performed and records maintained. Tolerances with respect to contract specification and execution drawings for various activities/processes shall be ascertained and submitted to OWNER/PMC for approval. Efforts shall be made to keep checks to avoid getting the non-conforming product. In case the tolerances are varying beyond the acceptable values given in the contract, non- conformation / resolution / waiver need to be got approved from OWNER/PMC. For Alloy and special piping materials and welds, PMI (positive material identification) shall be arranged by CONTRACTOR in position before final acceptance.



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## 7. DOCUMENTATION

7.1 The documentation plays a very important role in quality management including quality control. Necessary documentation shall be maintained by CONTRACTOR during completion of project and handed over to OWNER/PMC. Area(s) wherever PMC personnel are directly involved, particularly in witness and hold point, the copies of the same shall also be provided to them on inspection of those activities.

The documentation shall include the following but not limited to:

- a) Approved Quality Assurance Plan.
- b) Approved inspection and Test Plans.
- c) Inspection and test documents covering:
  - Manufacturer’s Test Certificate.
  - Material Receipt Report including Inspection Release Note applicable and site inspection and acceptance report on quality and quantity of material.
  - Site test/laboratory test report reviewed by CONTRACTOR for acceptance vis-à-vis to contract/code requirements of materials/ including PMI report at warehouse.
  - In process verification reports of CONTRACTOR representative to OWNER/ PMC as applicable.
  - Final verification report including any test checks done for compliance.
  - As-built vis-à-vis to contract/drawings including tolerances.
  - As-built for erection.
  - Non-conformance resolution raised by CONTRACTOR/OWNER/PMC.
  - Deviation approval by OWNER/ PMC.
  - Waiver / approval by OWNER/PMC in case there is variation from contract/drawings.

## 8. CONSTRUCTION QUALITY AUDIT

8.1 The PMC will carry out a Construction Quality Audit of the project facility near mechanical completion of the project by independent group of PMC personnel. The audit will utilize special tools such as positive material identification through alloy analysers, which shall be arranged by CONTRACTOR. PMC’s piping specialist groups will also carry out an additional audit of total piping system.

## 9. GENERAL NOTE AND LEGEND



### 9.1 GENERAL NOTE

Before start of work, the CONTRACTOR shall develop and submit for approval of OWNER / PMC, a detailed stage wise micro level Inspection & Test Plan depending upon the construction Process/technology to be deployed.

### 9.2 LEGEND

HP : Hold Point



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A point, which requires inspection/verification and acceptance by OWNER/PMC before any further processing is permitted.

The CONTRACTOR shall not process the activity /item beyond a Hold Point without written approval by OWNER/PMC except where prior written permission for further processing is available.

**W** : Witness Point

An activity which requires witnessing by OWNER/PMC when the activity is performed After proper notification has been provided (notification modalities and period shall be finalized beforehand) the CONTRACTOR is not obliged to hold further processing if OWNER/PMC is not available to witness the activity or does not provide comments before the date notified. Basis of acceptance shall be as per relevant technical specification.



**Rw** : Review of CONTRACTOR's Documentation

**S** : Surveillance Inspection by OWNER/PMC

Monitoring or making observations to verify whether or not material/items or services conform to specified requirements. Surveillance activities may include audit inspections, witness of testing, review of quality documentation & records, personnel qualifications etc.



**WC** : 100 % Examination by CONTRACTOR.

(Prime responsibility for execution of the inspection is with the CONTRACTOR. OWNER/PMC only)

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## 1. PRELIMINARY CIVIL WORKS

Format No. : QAP.CONST/C/01



Sl. No	Activity Description	Contractor	PMC
<b>A</b>	<b>Surveying</b>		
1	Boundary markings and submission of drawings/sketches.	WC	S
2	Black levels, contour plan, establishing permanent benchmarks (PBM) with reference to Survey of India benchmarks by check levels and submission of relevant drawings and records.	WC	S
3	Protection of control points and regular rechecking.	WC	S
4	Submission of Master Plan showing monuments, structures exposed rocks, weirs, water works, ponds etc.	WC	S
<b>B</b>	<b>Field Testing Equipments</b>		
1	Laboratory equipments.	WC	Rw
2	Calibration of Surveying Instruments	WC	Rw
3	Calibration of Field Testing Instruments	WC	Rw
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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## 2. SOIL INVESTIGATION

Format No. : QAP.CONST/C/02



Sl. No	Activity Description	Contractor	PMC
1	Bore hole data, collection of soil samples.	WC	S
2	Standard Penetration Test.	WC	Rw
3	Dynamic Cone Penetration Test.	WC	Rw
4	Pile Load Test and others (as applicable).	WC	W
5	Classification of soil.	WC	Rw
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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### 3. SITE GRADING

Format No. : QAP.CONST/C/03



Sl. No	Activity Description	Contractor	PMC
1	Clearing and stripping of soil including disposal of unsuitable materials	WC	S
2	Taking and plotting of initial joint levels at specified intervals for cutting as well as filling areas.	WC	S
3	Classification (Levels of strata) and testing of filling soil for suitability including preparation of Lead Charts to filling/disposal areas.	WC	S
4	Proper warning of explosions, misfires and storage of explosive materials (As applicable).	WC	S
5	Breaking up of clods, lumps, etc. at the time of filling and compaction.	WC	S
6	Identification and suitability of borrow areas for filling soil/murram including verification of payments for royalty, etc.	WC	Rw
7	Proctor compaction test for earth filling in specified layers including finished areas.	WC	S
8	Record of final finished grade levels.	WC	Rw
9	Computation of Earth works.	WC	Rw
10	Record of tree cuttings, stacking of blasted rocks and other quarry materials.	WC	Rw
11	Preparation of “As built drawings” indicating culverts, other open drainage facility etc.	WC	Rw
12	Removal of Surplus earth / excavated material and leveling in disposal areas.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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#### 4. EXCAVATION

Format No. : QAP.CONST/C/04

Sl. No	Activity Description	Contractor	PMC
1	Layout checking.	WC	S
2	Slopes of excavation, benching, overburden, shoring & strutting, barricading (in case of deep excavation)	WC	S
3	Check for sub-soil water, dewatering requirements as per specifications.	WC	S
4	Bottom level of excavation and compaction.	WC	S
5	List of obstacles encountered (cables, pipes, conduits, etc)	WC	S
6	Barricading of excavated Pits for Safety	WC	S
	<b>For Hard Rock</b>	WC	S
1	Obtaining license from district authorities for undertaking blasting operations.	WC	Rw
2	Storing of explosive material as per explosive rules.	WC	S
3	Prominent display of red flags around the area to be blasted.	WC	S
4	Check the dimensions of bore holes.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw



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## 5. BACK FILLING

Format No. : QAP.CONST/C/05

Sl. No	Activity Description	Contractor	PMC
1	Selection of material / selected earth	WC	S
2	Check for treatment of soil, if any.	WC	S
3	Filling in specified layers, consolidating, watering.	WC	S
4	Proctors compaction tests for layers.	WC	S
5	Filling to required levels.	WC	Rw
6	Selection of material / selected earth	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw





 <b>ONGC</b> एन ओ ए पी एल <b>MRPL</b>	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>			 <b>N</b> <b>nauvata</b> ENGINEERING & CONSULTING	
	<b>Part – A</b>	<b>ATTACHMENT – I</b> INDICATIVE INSPECTION & TEST PLAN FOR CIVIL & STRUCTURAL WORKS	Tender No :		3200000590
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## 6. ANTITERMITE TREATMENT

Format No. : QAP.CONST/C/06



Sl. No	Activity Description	Contractor	PMC
1	Preparation of surface for taking dosage of emulsion by ramming of each layer of soil by roding the earth at specified intervals.	WC	S
2	Check testing of material & spraying devices including personal protective equipments like facemask, gloves, shoes, etc.	WC	S
3	Backfilling and compaction in specified layers along with application of emulsifier along the sides of masonry & RCC structures.	WC	S
4	Check compaction of top surface for taking dosage of emulsifier by roding the earth at specified intervals for the entire floor area before concreting.	WC	S
5	Check for consumption of emulsifier utilized.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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## 7. PLAIN CEMENT CONCRETE

Format No. : QAP.CONST/C/07



Sl. No	Activity Description	Contractor	PMC
1	Checking of layout and materials.	WC	S
2	Mix Proportion.	WC	S
3	Check for shuttering if any.	WC	S
4	Concreting, Consolidation.	WC	S
5	Checking of top level of PCC.	WC	S
6	Curing.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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## 8. UNDER GROUND PIPING WORKS

Format No. : QAP.CONST/C/08



Sl. No	Activity Description	Contractor	PMC
1	Checking of material.	WC	S
2	Adequate slope, benching in excavation for safety purpose (if required)	WC	S
3	Layout, line & level.	WC	S
4	Laying & jointing, grouting at manholes/chambers	WC	S
5	Check for supports / firm bed / sub soil water level.	WC	S
6	Testing for leakages by blocking pipe ends.	WC	W
7	Hydro testing and other tests & flushing of system.	WC	HP
8	Backfilling in layers.	WC	S
9	Check for MS rungs in proper position, inlet / outlet pipe levels in manholes.	WC	S
10	Preparation of “As-built drawings”.	WC	W
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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## 9. BRICK WORK

Format No. : QAP.CONST/C/09



Sl. No	Activity Description	Contractor	PMC
1	Cleaning of surface.	WC	S
2	Checking and curing of bricks.	WC	S
3	Cement mortar proportion.	WC	S
4	Hacking of concrete surface.	WC	S
5	Check for bond/closers, thickness of joints.	WC	S
6	Line level & plumb.	WC	S
7	Racking out joints, keys in brick work, if any.	WC	S
8	Check for RCC bonds / Reinforcement / PCC flooring, in case of partition brickwork.	WC	S
9	Curing.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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## 10. PLASTERING

Format No. : QAP.CONST/C/10



Sl. No	Activity Description	Contractor	PMC
1	Check for completeness of all hidden jobs like piping, conduiting etc.	WC	S
2	Mix Proportion.	WC	S
3	Sample preparation for finish and its approval.	WC	W
4	Neeru application on plaster (As applicable)	WC	S
5	Hacking and cleaning the surface, removing loose particles, wetting the surface.	WC	S
6	Checking of plaster thickness, plumb & even surface.	WC	S
7	Check for grooves, openings, rounding off the corners and hollowness in plaster.	WC	S
8	Curing.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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## 11. FLOORING AND PAVEMENT

Format No. : QAP.CONST/C/11

Sl. No	Activity Description	Contractor	PMC
1	Layout checking.	WC	S
2	Mix Proportion.	WC	S
3	Check for proper back filling / completion of sub-Structure works.	WC	S
4	Check for edges of shuttering, alternate panels.	WC	S
5	Check for slopes, thickness of flooring.	WC	S
6	Shuttering, reinforcement, if any.	WC	S
7	Check for expansion joints / Construction joints.	WC	S
8	Check for concealed pipe embedments, earthing, if any	WC	S
9	Check for dividing strips, if any.	WC	S
10	Concreting, consolidating, test cubes.	WC	S
11	Checking for line, levels, slopes, joints and thickness of flooring viz. AFC drawings.	WC	S
12	Curing.	WC	S
13	Grinding & Polishing.	WC	S
14	Testing of concrete cubes (as applicable)	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw



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## 12. DOORS, WINDOWS AND VENTILATORS

Format No. : QAP.CONST/C/12

Sl. No	Activity Description	Contractor	PMC
1	Checking of material.	WC	S
2	Check for section & dimensions.	WC	S
3	Line, level & plumb.	WC	S
4	Section joinery details.	WC	S
5	Grouting with lugs dash fasteners.	WC	S
6	Check for fixtures & fittings.	WC	S
7	Check for thickness & type of glazing.	WC	S
8	Check for rubber gasket, anodizing (As applicable)	WC	S
9	Brand / shade of paints and no. of coats including surface preparation.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw





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### 13. PAINTING (BUILDING WORKS)

Format No. : QAP.CONST/C/13



Sl. No	Activity Description	Contractor	PMC
1	Completion of surface preparation.	WC	S
2	Checking of material.	WC	S
3	Confirmation of colour, shade & brand.	WC	S
4	Check for number of coats and thickness.	WC	S
5	Curing, if any.	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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#### 14. TANK PADS

Format No. : QAP.CONST/C/14



Sl. No	Activity Description	Contractor	PMC
1	Stripping the area	WC	S
2	Layout and ground level	WC	S
3	Excavation to required level, consolidating bottom	WC	S
4	Filling selected materials in specified layers, rolling, watering	WC	S
5	Compaction tests	WC	S
6	Gravel filling under annular ring (As applicable)	WC	W
7	Anti-corrosive layer, consolidation	WC	S
8	Premix carpeting on side slopes	WC	S
9	Preparation of “As-built drawing” for erection	WC	W
10	Check for settlement of pads during hydro testing of tanks	WC	W
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw

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## 15. MICRO GRADING

Format No. : QAP.CONST/C/15

Sl. No	Activity Description	Contractor	PMC
1	Clearing of extra soil, debris, etc. from site	WC	S
2	Removal of extra soil, debris, etc. by transportation	WC	S
3	Verification of gradient of ground	WC	S
4	Finishing of ground surface by hand compactor/ roller (As applicable)	WC	S
5	Visual final inspection	WC	S
	<b>Inspection and test documents</b>		
	Review Test and Inspection Document.	WC	Rw



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**ATTACHMENT – II**

**TO**



**REQUIREMENTS OF CONSTRUCTION QUALITY MANAGEMENT AND  
QUALITY CONTROL**

**INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS**

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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### INDEX

Sl. No	Description	Format No	No. of Sheets
1	Underground piping	QAP.CONST /M/01	3 + 2
2	Above ground piping/heater coils	QAP.CONST /M/02	4 + 8
3	Storage Tanks	QAP.CONST /M/03	4
4	Equipment erection (static)	QAP.CONST /M/04	2 + 2
5	Equipment erection (rotary)	QAP.CONST /M/05	2
6	Crane (EOT)	QAP.CONST /M/06	1

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**ABBREVIATIONS**

NDT	:	Non Destructive Testing
WPS	:	Welding Procedure Specifications
U/G	:	Under Ground
PT	:	Penetrant Testing
MT	:	Magnetic Particle Testing
PWHT	:	Post Weld Heat Treatment
HP	:	Hold Point A point, which requires inspection/verification and acceptance by OWNER/PMC before any further processing is permitted. The CONTRACTOR shall not process the activity /item beyond a Hold Point without written approval by OWNER/PMC except where prior written permission for further processing is available.
W	:	Witness Point An activity which requires witnessing by OWNER/PMC when the activity is performed After proper notification has been provided (notification modalities and period shall be finalized beforehand) the CONTRACTOR is not obliged to hold further processing if OWNER/PMC is not available to witness the activity or does not provide comments before the date notified. Basis of acceptance shall be as per relevant technical specification.
Rw	:	Review of CONTRACTOR's Documentation
S	:	Surveillance Inspection by OWNER/PMC Monitoring or making observations to verify whether or not material/items or services conform to specified requirements. Surveillance activities may include audit inspections, witness of testing, review of quality documentation & records, personnel qualifications etc.
WC	:	100 % Examination by CONTRACTOR.



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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## 1. UNDER GROUND PIPING

Format No. : QAP.CONST/M/01



Sl. No	Activity Description	Contractor	PMC
<b>A</b>	<b>Prior to fabrication</b>		
1	Incoming Material	WC	W
2	Welding Filler Material Approval/ Qualification	WC	HP
3	WPS/ PQR	WC	HP
4	Welder Performance Qualification	WC	HP
5	a) NDT Procedure Qualification	WC	HP
	b) PWHT Procedures Qualification (if any)	WC	HP
6	Preparation of Sketches	WC	S
7	Joint Numbering	WC	S
8	Material traceability & transfer of heat nos.	WC	S
<b>B</b>	<b>Fabrication (shop and field)</b>		
1	Material as per piping class (check w.r.t. approved colour coding procedure)	WC	S
2	a) Fit-up check	WC	S
	b) Dimensional check	WC	S
3	Check for purity of purging/ shielding gas	WC	S
4	Purging (if any)	WC	Rw/S
5	Shielding rate (if any)	WC	S
6	Basking of Electrodes	WC	S
7	Interpass cleaning & temperature check	WC	S
8	Visual check of completed welds	WC	S
9	Monitoring of PWHT Cycle	WC	S
10	Hardness Check	WC	S
11	PT/MT	WC	S
12	Radiography marking (for Random Radiography)	WC	W
13	Radiography Interpretation	WC	HP



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	<b>Marketing Infrastructure Projects, MRPL</b>				
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Format No. : QAP.CONST/M/01

Sl. No	Activity Description	Contractor	PMC
<b>C</b>	<b>Proof Testing</b>		
1	Procedure	WC	HP
2	Correctness of Testing arrangements	WC	S
3	Calibration of Pressure Gauges	WC	Rw
4	R.F. Pad testing, if any	WC	W
5	Positive Material Identification as per Specification after completion	WC	HP
6	Scrutiny of test packs for Mechanical & NDT Clearance (As per Annexure A)	WC	HP
7	Air / Water Flushing (preliminary)	WC	W
8	Pneumatic/ Hydro testing	WC	HP
9	Draining of Water & Air drying	WC	S
<b>D</b>	<b>Laying</b>		
1	Trench excavation and levels	WC	S
2	Cleaning of pipe surface	WC	S
3	Approval of wrapping/ coating material manufacturers	WC	HP
4	Approval of agency for wrapping & coating	WC	HP
5	Sample test of coating materials in approved laboratory	WC	Rw
6	Procedure qualification for wrapping & coating	WC	HP
7	Application of primer	WC	S
8	Coal tar temperature	WC	S
9	Coating and wrapping	WC	S
10	Calibration of Holiday tester	WC	HP
11	Holiday testing	WC	HP
12	Thickness of coating	WC	HP
13	Peel test	WC	HP
14	Lifting arrangement	WC	S
15	Lowering (levels & orientation of branches)	WC	S

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Format No. : QAP.CONST/M/01

Sl. No	Activity Description	Contractor	PMC
16	Checking of wrapping and coating for damages during lowering, their repair, holiday testing, etc.	WC	HP
17	Back filling	WC	S
18	Location, Brickwork, Plaster of valve pit	WC	S
19	Top cover & finish of valve pit	WC	S
<b>E</b>	<b>System Completion</b>		
1	Tie in joins (As per Annexure - A)	WC	W
2	Scrutiny of test packs for system testing (As per Annexure - B)	WC	W
3	System testing	WC	W

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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### Annexure – A to Format No. QAP.CONST/M/01

#### Inspection Report for Tie-In Joint (For U/G Piping)

Joint No : \_\_\_\_\_ Date : \_\_\_\_\_  
Report No : \_\_\_\_\_

Sr. No.	Activity	Date	Clearance by Contractor	Clearance by PMC
A	At the time of fit up			
B	Fit up			
C	Route run DP			
D	Final run DP			
E	Welder Number			
F	Radiography			
G	PWHT Hardness			
H	RF Pad testing			
I	Cleaning and priming			
J	Coating, Wrapping and Peel test			
K	Holiday checking			
L	Checking for damage, if any, in wrapping and coating and their repair after lowering, holiday testing etc.			
M	Backfilling			

Inspection at the above stages has been carried out by concerned and found satisfactory.



\_\_\_\_\_  
Contractor

\_\_\_\_\_  
PMC Mechanical

\_\_\_\_\_  
PMC Inspection

Note:

1. To be attached with final documents on completion

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**Annexure – B to Format No. QAP.CONST/M/01**

Report :

Area :

Plant :

Contractor :

Loop No :

Inch meter:

Sketch No : \_\_\_\_\_ From : \_\_\_\_\_ To :



Sr. No.	Activity	Check	Clearance by Contractor with Date & Sign	Clearance by PMC with Date & Sign
<b>A</b>	<b>Mechanical Completion Record (U/G Piping)</b>			
1	Clearance for flushing & testing			
1.1	Mechanical clearance Conformity with drawing			
1.2	Welding & NDT clearance			
a)	Material as per piping class			
b)	Fit-up check			
c)	Visual check of completed welds			
d)	LPI checks			
e)	RF pad testing			
2	Flushing & Pressure testing Medium Test pressure _____ Kg/cm <sup>2</sup>			
3	Coating and Wrapping			
a)	Surface preparation			
b)	Primer application			
c)	Coating, wrapping and peel test			
d)	Holiday check			
4	Laying			
a)	Trench leveling			
b)	Lowering & checking for damages in wrapping & coating, their repair, holiday testing, etc.			
5	Backfilling			

## Remarks

- Test loop sketches duly filled in to be enclosed with this (Jt.No. W.No. X SR. Chart No. along with XR Films, SR Charts etc.)

Review by Area Coordinator



Sign. \_\_\_\_\_ Date \_\_\_\_\_ Name \_\_\_\_\_ Designation \_\_\_\_\_

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## 2. ABOVE GROUND PIPING



Format No. : QAP.CONST/M/02

Sl. No	Activity Description	Contractor	PMC
<b>A</b>	<b>Prior to fabrication</b>		
1	Incoming Material	WC	W
2	Welding Filler Material Approval/ Qualification	WC	HP
3	WPS/ PQR	WC	HP
4	Welder Performance Qualification	WC	HP
5	a) NDT Procedure Qualification	WC	HP
	b) PWHT Procedures Qualification	WC	HP
6	Joint Numbering in Isometric drawings (Big & Small Bore)	WC	S
7	Preparation of Sketches for job in case of offsite piping and joint numbering	WC	S
8	Material traceability & transfer of heat nos.	WC	S
<b>B</b>	<b>Fabrication (Shop And Field)</b>		
1	Material as per piping class (check w.r.t. approved colour coding procedure)	WC	S
2	a) Fit-up check	WC	S
	b) Dimensional check	WC	S
3	Pre heat (if any)	WC	S
4	Check for purity of purging/ shielding gas	WC	Rw/S
5	Purging (if any)	WC	S
6	Shielding rate (if any)	WC	S
7	Basking of Electrodes	WC	S
8	Interpass cleaning & temperature check	WC	S
9	Visual check of completed welds	WC	S
10	Monitoring of PWHT Cycle	WC	S
11	Hardness Check	WC	S
	a) For carbon steel materials	WC	S
	b) For alloy steel materials	WC	W
	c) For alloy steel material heating coil	WC	HP

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b>			
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Format No. : QAP.CONST/M/02

Sl. No	Activity Description	Contractor	PMC
12	PT/MT	WC	S
13	Radiography marking (for Random Radiography)	WC	W
14	Radiography Interpretation	WC	HP
15	Spool Clearance	WC	HP
<b>C</b>	<b>Erection</b>		
1	Lifting arrangement	WC	S
2	Test Certificates for lifting tackles	WC	Rw
3	Location and orientation of branches	WC	S
4	Provision of Instrument Tappings	WC	S
5	Provision of vents and drains	WC	S
6	Correctness of type of supports, anchors, guides	WC	S
7	Correctness of gasket/ fasteners	WC	S
8	Correctness of valves (NRV, Gate, Globe, Control Valves), Steam traps and their direction of flow	WC	S
9	Provision of cold pull	WC	HP
<b>D</b>	<b>Proof Testing (See enclosed check list in Annexure – A)</b>		
1	Procedure	WC	HP
2	Correctness of testing arrangements	WC	S
3	All valves to be kept open and check if testing done against closed valve position	WC	S
4	Isolation of equipments, control valves, instruments, bellows, before testing. Removal of flappers from check valves	WC	S
5	Scrutiny of test packs for Mechanical and NDT Clearance	WC	HP
6	Positive Material Identification as per specification after completion of installation	WC	HP
7	Calibration of pressure gauges	WC	Rw
8	Air/Water flushing (preliminary)	WC	W
9	Pneumatic / Hydro testing (See Annexure - B)	WC	HP
10	Draining & drying	WC	S
11	Removal of temporary blinds/ supports	WC	W

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – II</b> INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS	Tender No :		3200000590
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Sl. No	Activity Description	Contractor	PMC
12	Pickling of system, if required	WC	W
13	Boxing up including reinstallation of flappers of check valves	WC	W
14	a) Check on fasteners & gaskets and record thereof	WC	Rw
	b) Torque tightening of flange joints	WC	S
15	System testing	WC	W
16	Setting of spring supports	WC	W
	<b>Inspection and test documents</b>		
	Review Test and Inspection Documents	WC	Rw

Note:

1. For liquidation of punch list refer Annexure – C.





	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**Annexure – A to Format No. QAP.CONST/M/02**Check list for Mechanical Clearance (A/G Piping)

Sheet 1 of 4

Project : \_\_\_\_\_ Report No : \_\_\_\_\_  
 Plant/Unit : \_\_\_\_\_ Date : \_\_\_\_\_  
 Contractor : \_\_\_\_\_ Area : \_\_\_\_\_  
 Loop No : \_\_\_\_\_ Inch meter : \_\_\_\_\_



Line No (Isometric No.)	Rev.	GAD NO.	Rev.	P&ID No.	Rev.
Sr. No.	Items to be checked		Acceptance by Contractor	Witness by Owner/ PMC as required by ITP	
1	Installation checked as per Isometric with respect to a) Configuration Route, plumb, elevation, clearance for thermal expansion/ insulation b) Branch Location, angle, orientation, type, R.F. pad etc. c) Steam Trap Direction				
2	Installation checked as per GAD with respect to a) Configuration Route, plumb, elevation, clearance for thermal expansion/ insulation				
3	Installation checked as per P&ID				
4	Isometrics completed for (enclosed) a) Joint numbering (Shop and Field welds) b) Spool numbering c) As-built routing and dimensions				
5	Valves (Check Rating, Gaskets, Flow direction, Sheet No. Tag No., Spindle direction. CSO, LO/LC, Damage etc.) a) Gate valves b) Globe valves c) Check valves d) Control valves Tag Nos. e) Safety Valves Tag Nos. f) Any other valves				

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**Annexure – A to Format No. QAP.CONST/M/02**Check list for Mechanical Clearance (A/G Piping)

Sheet 2 of 4



Sr. No.	Items to be checked	Acceptance by Contractor	Witness by Owner/ PMC as required by ITP
6	Strainers Check for clearance, flow direction, elements		
7	Flanged joints Total Nos. Check for type of flange Check for Rating Check for Alignment, (Proper gap and parallelity) Check for correct studs and nuts – dia, length, material, uniform protrusion of studs, anti-seize compound Check for correct gasket (type, size, spec., thickness, etc.) Torque values used for tightening		
8	Seal welding of Screwed connections (If required)		
9	Vents/ Drains as per Drawing. And provision of additional High Point vents and / or low point drains, if required.		
10	Reinforcement pads as per piping class		
11	Orifice flanges Check for Tag. No. Tapping orientation, tap valve, jack screw, straight run length of upstream and downstream		
12	Local Gauges: Check for accessibility		
13	Slope (When applicable)		
14	Supports a) Guides, Cross Guides, Trunnion etc. i Check for correct type, material and dimension ii Check welding iii Check for vent hole on pads (if applicable) iv Check offset for thermal expansion b) Spring supports i Verify tag no. and check details as per data sheet/ spring set ii Check for locking arrangement and any damage during transit, etc. iii Check for completeness of installation as per drg. Including welding of mounting cleat/ bracket iv Check for locking during installation and pressure test		

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – II</b> INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS	Tender No :		3200000590
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**Annexure – A to Format No. QAP.CONST/M/02**Check list for Mechanical Clearance (A/G Piping)

Sheet 3 of 4

Sr. No.	Items to be checked	Acceptance by Contractor	Witness by Owner/ PMC as required by ITP
	c) Bracket support and inserts with Anchor fasteners		
	i Check for members dimensions and materials		
	ii Check for welding		
	iii Check for bolting		
	iv Check for appearance damage		
15	Vents/ Drains		
	As per Drg		
	Orientation of valve handles		
	Clearance for hose		
	Requirement of additional vents/ drains (highest/ lowest pt.)		
16	Earthings		
	a) Check for location		
	b) Check for dimension of lug welding		
17	Joints History sheets enclosed for		
	a) Material Traceability as per Procedure No (Refer enclosed suggested format)		
	b) Fit ups checked		
	c) NDT Complete (Radiography, MT, PT)		
	d) Stress Relieving & Hardness Check complete		
	e) Positive Material Identification (PMI)		
18	Checked for Removal Binding off of:		
	a) Control, Safety and Check valves		
	b) In-line instruments		
	c) Rupture discs		
	d) Equipment nozzles		
	e) Others		
19	Supports and Weld/Flanged/ Screwed connections free from insulation or other coverage		
20	Checked installation of (Indicate location in Drawings)		
	a) Temporary Blinds, Spades		
	b) Temporary Strainers		
	c) Temporary Dummy-spools		
	d) Temporary Gaskets		
	e) Others		

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**Annexure – A to Format No. QAP.CONST/M/02**



Sheet 4 of

Check list for Mechanical Clearance (A/G Piping)

4

Sr. No.	Items to be checked	Acceptance by Contractor	Witness by Owner/ PMC as required by ITP
21	Expansion Bellows		
	a) Checks prior to installations		
	i. Physical damage		
	ii. Transit locks are intact		
	iii. Dimensions as per drgs.		
	b) Checks during installation		
	i. Parallelity of matching flanges		
	ii. Face to face dimensions of mating flanges		
	iii. Concentricity of matching flanges		
	iv. No stress on expansion bellows		
	v. Record		
	c) Isolation during pressure tests		
	i. Bellow manufacturer's recommendations on isolation of bellow during Pr. Test to be followed		
	ii. If recommended expansion bellow to be dropped during pressure test		
22	Cleanliness internally and externally		
23	Rotating equipment final alignment checked with piping		
24	Removal of unwanted construction supports		
25	Instrument tappings provided as per Drawing		
26	Physical Walk Through The Line Checked for gross irregularities including physical damages, unwanted tacks, arc strikes, spatters and space for thermal expansion		
	Other		
	Remarks		

<b>Contractor</b>			
Sign. :			
Date :			
Name :		Designation:	
<b>PMC</b>			
Sign :		Review by Area Coordinator (PMC)	
Date :		Sign:	
		Date:	
Name :		Designation:	
		Name : Designation:	

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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	<b>Section – A-1</b>	INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS		Document No: 20005-GEN-G-DOC-9128	
<b>Subsection – A-1.3</b>	Rev : 0				

### DAILY MATERIAL TRACEABILITY REPORT

(FOR ABOVE GROUND PIPING)

Contract No. : \_\_\_\_\_

Report No.: \_\_\_\_\_

Contractor: \_\_\_\_\_



Date: \_\_\_\_\_

Sl. No.	Line/ Heater No.	Are No.	Dia	Joint No.	Spool No.	Piping Component	Manufacturer	Heat/ Batch No.	Colour code	Verified		Remarks
										Contractor	PMC	

Contractor

PMC

**Note:** A Sketch of the spool may be enclosed.

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**Annexure – B to Format No. QAP.CONST/M/02**

Sheet 1 of 2

## Piping Hydro Test Release / Acceptance Record – A/G Piping

Project: _____	Report No: _____		
Plant/Unit: _____	Date : _____		
Contractor: _____	Area: _____ REF		
Loop No: _____	P&ID No. _____ INCH		
	MTR _____		
	From _____ To _____		
	Line No (s)	Isometric No.(s)	P&ID No.
Test Medium :		Test Duration	Design/ Test pressure
Test Pressure Gauge No.	Range	Calibration Certificate No.	Gauge Calibration Date
Items to check		Accept	Witness
		Contractor	PMC
Field installation Checklist prior to Hydrotest Signed			
Punch list prepared Yes/ No			
Pre-Hydrotest Punch items cleared			
Accessibility to inspection/ witness locations			
Capacity of pressurising pump checked			
Cordon off area for high pressure testing as required			
Pre-hydrotest flushing carried out			
IBR/Others test Witnessing required Yes/ No			
System released for Pressure Testing :			

Contractor		PMC	
Sign	Name	Sign	Name
Date		Date	
Designation		Designation	

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**Annexure – B to Format No. QAP.CONST/M/02**

Sheet 2 of 2



## Piping Hydro Test Release / Acceptance Record – A/G Piping

Activity	Date	Time
Water Filling and Venting started at		
Water Filling completed		
Vents closed		
Isolation of Pressurising pump		
Test completed at :		
- Water drained		
- Air		
- Temp Blinds Removed		
- Checked for reinstallation of		
a. Control & Safety valves		
b. On line instruments		
c. Rupture disks		
d. Deblinding		
e. Others		
- Cold setting of spring supports carried out		

Contractor		PMC	
Sign		Sign	
Date		Date	
Name	Designation	Name	Designation







	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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	<b>Subsection – A-1.3</b>		Rev :		0

### 3. STORAGE TANKS



Format No. : QAP.CONST/M/03

Sl. No	Activity Description	Contractor	PMC
<b>A</b>	<b>PRIOR TO FABRICATION</b>		
1	Acceptance of the tanks foundation	WC	W
2	Materials	WC	W
3	Filler materials tests and approval	WC	HP
4	WPS/ PQR	WC	HP
5	Welders performance qualification	WC	HP
6	Radiography procedure	WC	HP
7	Joint numbering in drawings	WC	S
8	Welding equipment and accessories	WC	S
9	Tools and Tackles	WC	S
10	Baking ovens		
	- Portable	WC	S
	- Heavy	WC	S
11	Jig & Fixtures	WC	S
12	Suitability of plate bending machine	WC	S
<b>B</b>	<b>FABRICATION/ ERECTION BOTTOM</b>		
1	Plate size, marking and cutting	WC	S
2	Blast cleaning & painting of underneath bottom plates	WC	S
3	Plate layout, overlap and fitup	WC	S
4	Sequence of welding to follow	WC	S
5	Size and positioning of backing plate for annular plates	WC	S
6	Baking of electrodes/ interpass cleaning	WC	S
7	Visual check	WC	S
8	LPI/MPI/ Radiography of annular plate butt welds and bottom plate butt welds (if any)	WC	HP
9	Vacuum/ MPI/ LPI of shell portion of the bottom plates	WC	HP
10	Vacuum box test for the bottom plate welding	WC	HP

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Sl. No	Activity Description	Contractor	PMC
	<b>SHELL</b>		
1	Plate size, marking and cutting.	WC	S
2	Plate bending, curvature check, stacking.	WC	S
3	Shell course alignments and fit-up of vertical and circumferential joints.	WC	S
4	Shell diameter, circularity, perpendicularity, straightedge before welding.	WC	HP
5	Visual and Back chip check	WC	S
6	Second side visual.	WC	S
7	Location, size and alignment of nozzles and other openings	WC	HP
8	R.F.Pads fit-up / welding.	WC	W
9	PWHT of RF pad. Nozzles & manhole, etc. (As applicable)	WC	HP
10	Radiography marking for Random radiography only	WC	W
11	Curbangle and Wind girders fit-up / welding	WC	S
12	MPI/LPI nozzles, wind girders fit-up/welding.	WC	W
13	RF Pads air test.	WC	HP
14	Shell to bottom fit-up	WC	W
15	Shell to bottom I/S welding root run visual/ Oil chalk test	WC	HP
16	Shell to bottom O/S welding visual and LPI for toe cracks	WC	HP
17	Fabrication and erection of stairways	WC	S
18	Cleats welding for insulation	WC	S
19	Radiography interpretation.	WC	HP
a	Extension marking for repair	WC	HP
	<b>FIXED ROOF</b>		
1	Location and welding of roof supports.	WC	S
2	Alignment and welding of Roof Structures.	WC	W

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Sl. No	Activity Description	Contractor	PMC
3	Plate layout, overlap and fitup	WC	S
4	Visual check of roof welds	WC	W
5	Location, size and alignment of roof man-holes and vents	WC	S
6	PWHT (As applicable)	WC	HP
<b>FLOATING ROOF</b>			
1	Temporary staging spacing and levels	WC	S
2	Plate size, straightening and cutting	WC	S
3	Plate layout, overlap and fit up/ welding	WC	S
4	Buoys fabrications	WC	S
5	Vacuum testing of roof-plate welds	WC	HP
6	Location of sleeve supports	WC	W
7	Pad plate welding with roof and sleeve support	WC	W
8	Fixing and welding of Buoys	WC	S
9	Initial – lift	WC	W
10	Supports fixing through sleeves	WC	S
11	Seal welding of support sleeves from beneath after dewatering	WC	W
12	Air test of Buoys	WC	HP
13	Pontoon welding	WC	W
14	Location, fixing and welding of man holes, drains etc.	WC	S
15	Shell to pontoon clearance	WC	W
16	Seal fixing	W	W

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Sl. No	Activity Description	Contractor	PMC
<b>C</b>	<b>TESTING</b>		
1	Correctness of testing arrangements especially size of blind flanges/ vents/ drains/ temporary piping	WC	S
2	Mechanical / Inspection clearances	WC	HP
3	Earthing of ladder and shell	WC	W
4	Settlement readings during water filling	WC	W
5	Hammer test	WC	HP
6	Air pressure test	WC	HP
7	Vacuum test	WC	HP
8	Hydro test	WC	HP
9	Roof collapsibility test in case of floating roof tanks	WC	HP
<b>D</b>	<b>PAINTING AND INSULATION</b>		
1	Cleaning	WC	S
2	Painting	WC	W
3	Insulation	WC	W
	<b>Inspection &amp; Test Documents</b>		
	Review Test and Inspection Documents	HP	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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#### 4. EQUIPMENT ERECTION (Static)

Format No. : QAP.CONST/M/04



Sl. No	Activity Description	Contractor	PMC
<b>1</b>	<b>BEFORE ERECTION</b>		
A	Execution scheme	WC	Rw
B	Materials supply	WC	W
C	Readiness of erection	WC	S
I	Level of foundation (shims/ packing with marking to be prepared & kept ready)	WC	S
II	No. & Size of bolts	WC	S
III	Hole dia and no. of hole in base/ structure of equipment and columns	WC	S
IV	Equipment base with actual foundation	WC	S
V	Checking the threads of bolts & nuts	WC	S
VI	Chipping & roughening of foundation	WC	S
VII	C/L marking on equipment	WC	S
<b>2</b>	<b>ERECTION SCHEMES FOR CRITICAL EQUIPMENTS</b>		
A	Approval of Rigging procedure (As per Annexure – 1)	WC	HP
<b>3</b>	<b>SAFETY TEST</b>		
A	Load test of cranes, lifting beams, slings and shackles, length and dia. of sling & condition of wire rope (Broken/ damaged – strands should not be there)	WC	W
<b>4</b>	Cross checking if Data-sheet w.r.t. orientation, base plate details	WC	S
<b>5</b>	<b>DURING ERECTION</b>		
A	Orientation to be checked	WC	S
B	Placement of packing as per marking	WC	S
C	Outside cleaning, coating/ wrapping, painting for underground equipment	WC	W

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Format No. : QAP.CONST/M/04



Sl. No	Activity Description	Contractor	PMC
<b>6</b>	<b>AFTER ERECTION</b>		
A	Tightening of Bolts and providing washers	WC	S
B	Levelling and alignment of equipments	WC	HP
C	Corresponding requirement elevation and distance between nozzles in special cases	WC	S
D	Cleaning of sleeves before grouting	WC	S
E	Grouting	WC	S
F	Final tightening of bolts	WC	S
G	Internals installation after PMI as required		
	i. Critical equipments	WC	HP
	ii. Other equipments	WC	W
<b>7</b>	<b>TESTS</b>		
	As per specification	WC	W
<b>8</b>	Packing of column (As per Annexure – 2)	WC	W
<b>9</b>	Final Boxing up	WC	W
	<b>Inspection &amp; Test Documents</b>		
	Review Test and Inspection Documents	HP	Rw



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>			
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<b>Subsection – A-1.3</b>	Rev : 0			



Format No. : QAP.CONST/M/04

Sl. No	Activity Description	Contractor	PMC
	<b>ERECTION SCHEME FOR CRITICAL EQUIPMENT</b> (Rigging Procedure)		
<b>1</b>	<b>BEFORE ERECTION</b>		
A	Checking proper sequence for lifting of the equipment	WC	Rw
B	To check weight of equipment	WC	Rw
C	To check the centre of gravity	WC	Rw
D	To check suspension points	WC	Rw
E	To check the maximum/ minimum radius at which the lifting tackle will operate	WC	Rw
F	To check the maximum load to be lifted including wt. Of slings, hook- block, lifting beams and equipment etc.	WC	Rw
G	To identify the safe crane with requisite capacity	WC	Rw
<b>2</b>	<b>DURING ERECTION</b>		
A	To check counter weight of crane and Boom length	WC	Rw
B	To check slew limitations of crane	WC	Rw
C	To check ground conditions are adequate for supporting fully rigged crane and load	WC	Rw
D	To check the crane can be traveled in loaded condition	WC	Rw
E	To check clearances from overhead electric power cables	WC	Rw
F	To check maintenance certificates	WC	Rw
G	To check whether operators, riggers have received proper instructions	WC	Rw
H	To verify safe load indicator been supplied to rig the crane	WC	Rw
I	To check the adequacy of bracing of equipment by guys	WC	Rw
J	To check the guys, shoring, bracing, interference with other works	WC	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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Sl. No	Activity Description	Contractor	PMC
	<b>PACKING COLUMN</b>		
<b>1</b>	<b>BEFORE INSTALLATION</b>		
A	Identify the material; check thickness, dimensions, no. and angle of fingers of packing rings	WC	S
<b>2</b>	<b>DURING INSTALLATION</b>		
A	Degreasing and cleaning of packing material	WC	S
B	Check packing support plate	WC	S
C	Check for stacked or dumped packing as per specifications	WC	S
D	Check for nesting	WC	S
E	Check for packing are touching bed limiter (when issued and top level)	WC	S

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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## 5. EQUIPMENT ERECTION (ROTARY)



Format No. : QAP.CONST/M/05

Sl. No	Activity Description	Contractor	PMC
<b>1</b>	<b>BEFORE ERECTION</b>		
A	Execution scheme	WC	Rw
B	Foundation check		
I	Level / centerline of foundation	WC	S
II	No / Dia / Length of anchor bolts, Depth of pockets, verticality of pockets	WC	S
III	Chipping, roughing and cleaning of pockets	WC	W
<b>2</b>	<b>LIFTING TACKLES</b>		
	Crane/beams/ slings/ shackles etc. to be checked for weight of equipments	WC	S
<b>3</b>	<b>VISUAL INSPECTION OF EQPTS. TAG/ IDENTIFICATION NO.</b>		
A	For any damage	WC	S
B	Free shaft rotation	WC	S
<b>4</b>	<b>Drilling and Tapping (if reqd.) hole in the base plate of eqpt.</b>		
a.	Size/ Taps	WC	S
	<b>DURING ERECTION</b>		
A	Level/ elevation of base frame	WC	W
B	All foundation bolts to be checked	WC	S
C	Grouting of base frame / pocket grouting	WC	W
D	Orientation of eqpts.	WC	W
E	Elevation/ Level of eqpts.	WC	HP
F	Shimsize/ material/ thickness	WC	W
G	Distance between couplings	WC	W
H	No-load run of motors	WC	W
I	Alignment readings		
	- Without piping (Loose bolts)	WC	HP
	- With piping (After tightening the flange bolt)	WC	HP

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – II</b> INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS	Tender No :		3200000590
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Format No. : QAP.CONST/M/05



Sl. No	Activity Description	Contractor	PMC
J	Type of grout and grouting	WC	S
K	All protection and safety guards installation	WC	S
	<b>AFTER ERECTION</b>		
A	Auxiliary connections to be mounted on eqpts. as per drawing	WC	S
B	Tests as per spec.	WC	W
C	Log book maintenance (For rotating of shaft, lubrication Oil reservoir full, all plugs in positions)	WC	S
	<b>INSPECTION &amp; TEST DOCUMENTS</b>		
	Review test and Inspection documents	HP	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – II</b> INDICATIVE INSPECTION & TEST PLAN FOR MECHANICAL WORKS	Tender No :		3200000590
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	<b>Subsection – A-1.3</b>		Rev :		0

## 6. EOT / HOT CRANE



Format No. : QAP.CONST/M/06

Sl. No	Activity Description	Contractor	PMC
<b>1</b>	<b>BEFORE ERECTION</b>		
	a) Execution scheme	WC	Rw
	b) Materials supply (contractor)	WC	W
	c) Readiness for erection		
	d) Structural steel girder span center to center and elevation difference	WC	S
	e) Check center to center distance of rails, gaps, elevations, crab wheels distances	WC	S
	f) Check buffer stops	WC	S
2	a) Erection and assembly of components like LT, Crane Girders, Crab, Platforms, etc.	WC	S
	b) Review of hoist ropes and assembly of hook blocks	WC	S
3	a) Electrical installation, testing and no load test of motor	WC	S
	b) Coupling of motors to drives	WC	S
<b>4</b>	<b>NO LOAD TEST</b>		
	a) Winding & unwinding test	WC	W
	b) Traversing test	WC	W
	c) Traveling test	WC	W
<b>5</b>	<b>LOAD TEST</b>		
	a) Winding & unwinding test	WC	W
	b) Traversing test	WC	W
	c) Traveling test	WC	W
	d) Load & Over load testing	WC	W
	e) Deflection of girder	WC	W
	INSPECTION & TEST DOCUMENTS		
	Review test and Inspection Documents	HP	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :		3200000590
	<b>Section – A-1</b>		Document No:		20005-GEN-G-DOC-9128
<b>Subsection – A-1.3</b>		Rev :	0		

**ATTACHMENT – III**  
**TO**  
**REQUIREMENTS OF CONSTRUCTION QUALITY MANAGEMENT/  
QUALITY CONTROL**



**INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS**

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :		3200000590
	<b>Section – A-1</b>		Document No:		20005-GEN-G-DOC-9128
<b>Subsection – A-1.3</b>	Rev :		0		

### ABBREVIATIONS



CEIL	:	Certification Engineers International Limited
CIMFR	:	Central Institute of Mining & Fuel Research
CE	:	Carbon Equivalent
DFT	:	Dry Film Thickness
DPT	:	Dye Penetrant Testing
DHT	:	De-hydrogen Heat Treatment
ERTL	:	Electronics Regional Test Laboratory
FCRI	:	Fluid Control Research Institute
HT	:	Heat Treatment
HIC	:	Hydrogen Induced Cracking
ITP	:	Inspection and Test Plan
IP	:	Ingress Protection
IHT	:	Intermediate Heat Treatment
IC	:	Inspection Certificate
IGC	:	Inter Granular Corrosion
MPT/MT	:	Magnetic Particle Testing
MTC	:	Material Test Certificate
MRT	:	Mechanical Run Test
NDT	:	Non Destructive Testing
NPSH	:	Net Positive Suction Head
PO	:	Purchase Order
PESCO	:	Petroleum Explosive Safety Organization
PQR	:	Procedure Qualification Record
PR	:	Purchase Requisition
PMI	:	Positive Material Identification
RT	:	Radiography Testing
SSCC	:	Sulphide Stress Corrosion Cracking
TC	:	Test Certificate
TPI or TPIA	:	Third Party Inspection Agency
UT	:	Ultrasonic Testing
VDR	:	Vendor Data Requirement
WPS	:	Welding Procedure Specification
WPQ	:	Welders Performance Qualification



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :		3200000590
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4	Flanges, Spectacle Blinds & Drip Rings	QAP.CONST/PI/04	2



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
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## 1. SEAMLESS PIPES

Format No. : QAP.CONST/PI/01

Rev : A

Sl. No.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION	
					SUPPLIER	PMC
<b>1.0</b>	<b>Procedure</b>					
1.1	Hydrostatic Test, Heat Treatment, NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	H	R
<b>2.0</b>	<b>Material Inspection</b>					
2.1	Raw Material Inspection	Chemical & Mechanical Properties	100%	Test Certification	H	-
<b>3.0</b>	<b>In Process Inspection</b>					
3.1	Heat Treatment	Stress Relieving, Normalizing, Tempering, Solution Annealing, Stabilization Heat treatment etc. as applicable	100%	HT chart	H	R
3.2	NDT As applicable	Surface & Internal Imperfections	PR / Purchase Specification	NDT Reports	H	R
3.3	Identification of Test Samples	Product Chemical, Mechanical, Impact, IGC and Other test as applicable	PR / Purchase Specification	Test Reports	H	H (Note-1)
3.4	Product Analysis	Chemical Composition	PR / Purchase Specification	Test Reports	H	R
3.5	Destructive Testing	Mechanical, Impact, IGC and Other test as applicable	PR / Purchase Specification	Test Reports	H	H (Note-1)
3.6	Galvanizing (If Applicable)	Integrity OF Galvanized Coating	100%	Inspection Report	H	R
<b>4.0</b>	<b>Final Inspection</b>					
4.1	Hydrostatic Testing	Leak Check	100%	Test Report	H	RW (Note-1)
4.2	Visual and Dimensional Inspection (VDI)	Surface Condition, Straightness, End Finish, Bevel Angle, Root Face, Outer Dia., Thickness, Length, End Finish, Marking, End Cap etc.	100%	Inspection Report	H	RW (Note-1)
4.3	Weight Checking as applicable	Weight	100% By Supplier	Inspection Report	H	-
4.4	PMI Check	Chemical Check	As per Spec	Inspection Report	H	RW
4.5	Stamping	Stamping of Accepted Pipe	Stamping of Pipes Which are witnessed by PMC/TPIA.	Inspection Report	H	H

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
	<b>Section – A-1</b>		Document No:	20005-GEN-G-DOC-9128	
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<b>5.0</b>	<b>Painting</b>					
5.1	Rust Preventive Coating & Color Coding (As applicable)	Visual & Color Coding as applicable	100%	Inspection Report	W	-
<b>6.0</b>	<b>Documentation &amp; IC</b>					
6.1	Documentation & Inspection Certificate(IC)	Reviews of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	H	H

**LEGEND:**

- H : Hold (Do not proceed without approval).
- P : Perform
- RW : Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk tem)
- R : Review
- W : Witness (Give due notice, work may proceed after scheduled date).

**NOTES (As applicable):**



1. For Non NACE & Non Hydrogen service Carbon Steel Pipes up to size 12” will be accepted on review of Supplier Test Certificates. Supplier Test Certificate to be reviewed by PMC/TPIA.
2. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable,(Unless otherwise agreed upon)
3. Acceptance forms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification / Approved Documents.
4. For orders placed on stockist. Items shall be accepted based on manufacturer’s TC with EN10204 type 3.2 certification from PMC approved suppliers.

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b>				
	<b>Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
	<b>Section – A-1</b>		Document No:	20005-GEN-G-DOC-9128	
<b>Subsection – A-1.3</b>	Rev :		0		

## 2. VALVES

Format No. : QAP.CONST/PI/02

Sl. No.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION	
					SUPPLIER	PMC
<b>1.0</b>	<b>Procedure</b>					
1.1	Hydrostatic Test, Heat Treatment, NDT, Helium Leak Test and Other Procedures	Documented Procedures	100%	Procedure Documents	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification Record	100%	WPS,PQR & WPQ	H	W – New R – Existing
1.3	Pre-Qualification Tests	Fire safe, Cryogenic & other Test as applicable	As per PR/Purchase Specification	Acceptance Report	H	H (If New)
<b>2.0</b>	<b>Material Inspection</b>					
2.1	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Chemical, Mechanical, Heat Treatment, NDT,IGC & Other Properties as applicable	100%	Test Certification	R	R
2.2	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Visual & Dimension	100%	Inspection Report	H	-
2.3	Body and Bonnet Hastings	Radiography Examination	PR / Purchase Specification	Films and report	R	R
2.4	Bars for Trim material	Chemical Analysis	Each Heat	Test Certificates & Lab Report	R	-
2.5	Gaskets, Gear units, Fasteners, Gland, Packing's etc.	Physical / Chemical Properties	100%	Test Certificates & Lab Report	R	-
2.6	Actuators as applicable	Perform Statutory Certificates as applicable	100%	Test Certificates & Lab Report	H	R
<b>3.0</b>	<b>In Process Inspection</b>					
3.1	Welding	Welding parameters as per WPS / PQR	100%	Inspection Reports	H	-
3.2	Machining of components	Visual / Dimension	100%	Inspection Reports	H	-
<b>4.0</b>	<b>Final Inspection</b>					
4.1	Hydrostatic / Pneumatic test and Helium Leak test as Testing	Leak Check	PR / Purchase Specification	Test Report	H	RW (Note-1)
4.2	Visual / Dimension	Surface & Dimension Check	100%	Test Report	H	RW (Note-1)

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
	<b>Section – A-1</b>		Document No:	20005-GEN-G-DOC-9128	
	<b>Subsection – A-1.3</b>		Rev :	0	



4.3	Functional Test for Actuator Operated valves	Satisfactory Performance	100%	Test Report	H	RW
4.4	PMI Check	Chemical	As per Spec	Inspection Report	H	RW
4.5	Strip Check (As Applicable)	Verify Components & Differential harness if applicable	PR / Purchase Specification	Inspection Report	H	RW (Note-1)
4.6	Final Stamping	Stamping of Accepted Valves	Stamping of valves which are witnessed by PMC/TPIA	Inspection Report		H (Note-1)
<b>5.0</b>	<b>Painting</b>					
5.1	Painting and color coding as applicable	Visual / DFT Check	100%	Inspection Report	H	-
<b>6.0</b>	<b>Documentation &amp; IC</b>					
6.1	Documentation & Inspection Certificate(IC)	Reviews of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	H	H

**LEGEND:**

- H : Hold (Do not proceed without approval).
- P : Perform
- RW : Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk tem)
- R : Review
- W : Witness (Give due notice, work may proceed after scheduled date).

**NOTES (As applicable):**

1. For Non NACE & Non Hydrogen service Carbon Steel Valves up to size 12” will be accepted on review of Supplier Test Certificates. Supplier Test Certificate to be reviewed by PMC/TPIA.
2. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable,(Unless otherwise agreed upon)
3. Acceptance forms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification / Approved Documents.



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b>					
	<b>Marketing Infrastructure Projects, MRPL</b>					
	<b>Part – A</b>	<b>ATTACHMENT – III</b>		Tender No :		3200000590
	<b>Section – A-1</b>	INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS		Document No:		20005-GEN-G-DOC-9128
<b>Subsection – A-1.3</b>	Rev :			0		

### 3. FORGED, SEAMLESS & WELDED FITTINGS

Format No. : QAP.CONST/PI/03

Rev : A

Sl. No.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION	
					SUPPLIER	PMC
<b>1.0</b>	<b>Procedure</b>					
1.1	Hydrostatic Test / NDT	Documented Procedures	100%	Procedure Documents	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification	100%	WPS,PQR & WPQ	H	W – New R – Existing
<b>2.0</b>	<b>Material Inspection</b>					
2.1	Raw Material Identification (Billets, Rounds, Pipes, Coil, Plates etc)	Chemical and Mechanical Properties	100%	Mill test certificate, Supplier's Inspection Report	H	R
<b>3.0</b>	<b>In Process Inspection</b>					
3.1	Forming & Welding	Forming & Welding Parameters	100%	Supplier's records	H	-
3.2	Ferrite Check of SS Welds (If Applicable)	% Ferrite Check	100%	Inspection Report	H	R
3.3	Heat Treatment	Stress Reliving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT Chart / Report	H	R
3.4	NDT As Applicable	Surface & Internal Imperfections	PR / Purchase Specification	NDT Reports	H	R
3.5	Identification of Test Samples	Product Chemical, Mechanical, Impact, IGC and Other test as applicable	100%	Test Reports	H	H (Note –1)
3.6	Product Analysis	Chemical Composition	PR / Purchase Specification	Test Reports	H	R
3.7	Destructive Testing	Mechanical, Impact, IGC and Other test as applicable	100%	Test Reports	H	H (Note –1)
3.8	Galvanizing (If Applicable)	Integrity of Galvanised Coating	100%	Inspection Report	H	-
<b>4.0</b>	<b>Final Inspection</b>					
4.1	Visual and Dimension	Size, Thickness / Schedule, Dimensions, Surface quality, Marking etc.	100%	Inspection Report	H	RW (Note-I)
4.2	PMI Check	Chemical Check	As per Spec	Inspection Report	H	RW

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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4.3	Final Stamping	Stamping of Accepted Fittings	Stamping of Fittings which are witnessed by PMC/TPIA	Inspection Report	H	H (Note-I)
5.0	<b>Painting</b>					
5.1	Rust Preventive coating & color Coding	Visual & Color Coding as applicable	100%	Inspection Report	W	-
6.0	<b>Documentation &amp; IC</b>					
6.1	Documentation & Inspection Certificate(IC)	Reviews of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	H	H



**LEGEND:**

H	:	Hold (Do not proceed without approval).
P	:	Perform
RW	:	Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk tem)
R	:	Review
W	:	Witness (Give due notice, work may proceed after scheduled date).

**NOTES (As applicable):**

1. For Non NACE & Non Hydrogen service Carbon Steel Flanges, Spectacle Blinds & Drip Rings up to size 24" -300 ANSI Class will be accepted on review of Supplier Test Certificates. Supplier Test Certificate to be reviewed by PMC/TPIA.
2. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable,(Unless otherwise agreed upon)
3. Acceptance forms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification / Approved Documents.





	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b> <b>Marketing Infrastructure Projects, MRPL</b>				
	Part – A	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
	Section – A-1		Document No:	20005-GEN-G-DOC-9128	
Subsection – A-1.3	Rev :		0		

#### 4. FLANGES, SPECTACLE BLINDS & DRIP RINGS

Format No. : QAP.CONST/PI/04

Rev : A

Sl. No.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION	
					SUPPLIER	PMC
<b>1.0</b>	<b>Procedure</b>					
1.1	Hydrostatic Test , NDT and Other Procedures	Documented Procedures	100%	Procedure Documents	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification	100%	WPS,PQR & WPQ	H	W – New R – Existing
<b>2.0</b>	<b>Material Inspection</b>					
2.1	Raw Material Inspection	Chemical and Mechanical Properties	100%	Test certificate	H	R
<b>3.0</b>	<b>In Process Inspection</b>					
3.1	Welding / Forging	Forging / Welding Parameters	100%	Inspection Reports	H	-
3.2	Heat Treatment	Stress Reliving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT Chart	H	R
3.3	Identification of Test Samples	Product Chemical, Mechanical, Impact, IGC and Other test as applicable	100%	Test Reports	H	H (Note –1)
3.4	Product Analysis (As Applicable)	Chemical Composition	PR / Purchase Specification	Test Reports	H	R
3.5	Destructive Testing	Mechanical, Impact, IGC and Other test as applicable	100%	Test Reports	H	H (Note –1)
3.6	NDT (As Applicable)	Surface & Internal Imperfections	PR / Purchase Specification	NDT Reports	H	R
3.7	Galvanizing (If Applicable)	Integrity of Galvanised Coating	100%	Inspection Report	H	-
<b>4.0</b>	<b>Final Inspection</b>					
4.1	Final Inspection	1. Visual 2. Dimension 3. Hardness 4. Marking etc	100%	Inspection Report	H	H (Note-1)
4.2	PMI Check	Chemical Check	As per Spec	Inspection Report	H	RW
4.3	Final Stamping	Stamping of Accepted Fittings	Stamping of Items which are witnessed by PMC/TPIA	Inspection Report	H	H (Note-1)

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – III</b> INDICATIVE INSPECTION & TEST PLAN FOR PIPING WORKS	Tender No :	3200000590	
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<b>5.0</b>	<b>Painting</b>					
5.1	Rust Preventive coating & color Coding	Visual & Color Coding as applicable	100%	Inspection Report	H	-
<b>6.0</b>	<b>Documentation &amp; IC</b>					
6.1	Documentation & Inspection Certificate (IC)	Reviews of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	H	H

**LEGEND:**



- H : Hold (Do not proceed without approval).
- P : Perform
- RW : Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk tem)
- R : Review
- W : Witness (Give due notice, work may proceed after scheduled date).

**NOTES (As applicable):**

- For Non NACE & Non Hydrogen service Carbon Steel Fittings up to size 14" will be accepted on review of Supplier Test Certificates. Supplier Test Certificate to be reviewed by PMC/TPIA.
- This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable,(Unless otherwise agreed upon)
- Acceptance forms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification / Approved Documents.
- For orders placed on stockist. Items shall be accepted based on manufacturer's TC with EN10204 type 3.2 certification from PMC approved suppliers.



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – IV</b> INDICATIVE INSPECTION & TEST PLAN FOR ELECTRICAL WORKS	Tender No :		3200000590
	<b>Section – A-1</b>		Document No:		20005-GEN-G-DOC-9128
	<b>Subsection – A-1.3</b>		Rev :		0

**ATTACHMENT – IV**  
**TO**  
**REQUIREMENTS OF CONSTRUCTION QUALITY MANAGEMENT/  
QUALITY CONTROL**  
  
**INDICATIVE INSPECTION & TEST PLAN FOR ELECTRICAL WORKS**

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – IV</b> INDICATIVE INSPECTION & TEST PLAN FOR ELECTRICAL WORKS	Tender No :		3200000590
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<b>Subsection – A-1.3</b>	Rev :		0		



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	<b>Subsection – A-1.3</b>		Rev :		0

### ABBREVIATIONS

NDT	:	Non Destructive Testing
WPS	:	Welding Procedure Specifications
U/G	:	Under Ground
PT	:	Penetrant Testing
MT	:	Magnetic Particle Testing
PWHT	:	Post Weld Heat Treatment
HP	:	Hold Point A point, which requires inspection/verification and acceptance by OWNER/PMC before any further processing is permitted. The CONTRACTOR shall not process the activity /item beyond a Hold Point without written approval by OWNER/PMC except where prior written permission for further processing is available.
W	:	Witness Point An activity which requires witnessing by OWNER/PMC when the activity is performed After proper notification has been provided (notification modalities and period shall be finalized beforehand) the CONTRACTOR is not obliged to hold further processing if OWNER/PMC is not available to witness the activity or does not provide comments before the date notified. Basis of acceptance shall be as per relevant technical specification.
Rw	:	Review of CONTRACTOR's Documentation
S	:	Surveillance Inspection by OWNER/PMC Monitoring or making observations to verify whether or not material/items or services conform to specified requirements. Surveillance activities may include audit inspections, witness of testing, review of quality documentation & records, personnel qualifications etc.
WC	:	100 % Examination by CONTRACTOR.

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka</b>				
	<b>Marketing Infrastructure Projects, MRPL</b>				
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## 1. MOTOR

Format No. : QAP.CONST/E/01

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Sl. No	Activity Description	Contractor	PMC
1	Check foundation, its level and center line markings, ensure the depth of anchor grouting pockets and straightness of anchor bolts. Foundation should be thoroughly cleaned before placement of equipment.	WC	S
2	Check equipment nameplate, identify the equipment referring to vendor's shop floor test certificate and construction drawing.	WC	S
3	Check area classification.	WC	S
4	Assure sealing of all exposed outlets during erection / assembly.	WC	HP
5	Check installation of equipment, its leveling, alignment and coupling with driven equipment (Before coupling magnetic centering must be ensured)	WC	S
6	Ensure fixing of all accessories temp. Indicators, cooling system lubricating pumps, etc.	WC	S
7	Ensure pedestal insulation.	WC	S
8	Check lubrications of bearing, their suitability and level. For lubricants vendor instruction and specifications to be followed.	WC	S
9	Ensure Air-gap as per vendor instruction (for big machines assembled at site)	WC	HP
10	Ensure all spacers and blockings used for transportation and erection have been removed.	WC	HP
11	Check earthing of the equipment and earth connection. Ensure earth resistance.	WC	S
12	a) Check IR and PI for the equipment and IR for auxiliary circuits like heaters and thermal detectors, excitor (for system motor only) etc. b) In case of low IR/PI, dehydrate the equipment by suitable method as per vendor's recommendation.	WC	S
13	Measure winding Resistance (if specified)	WC	W
14	Inspect space heater and control cable connections. Ensure the tightness of connection, proper glanding and earthing of armour, correct phase sequence of supply cable as per hire mark and closing the covers of terminal boxes.	WC	S
15	Check dis-coupling of equipment for no-load run and ensure re-establishing the same without disturbing original alignment.	WC	HP
16	Set the temperature indicators (alarm / trip) and vibration monitors.	WC	S
17	Mechanical Acceptance Test.	WC	W
18	Inspection and test requirements Review Test and Inspection Documents	HP	Rw



Note: Activities pertaining to Sl. No. 5 and 15 will be checked by Mechanical Group

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**ATTACHMENT – V**  
**TO**  
**REQUIREMENTS OF CONSTRUCTION QUALITY MANAGEMENT/  
QUALITY CONTROL**



**INDICATIVE INSPECTION & TEST PLAN FOR PAINTING WORKS**



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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	<b>Part – A</b>	<b>ATTACHMENT – V</b> INDICATIVE INSPECTION & TEST PLAN FOR PAINTING WORKS	Tender No :		3200000590
	<b>Section – A-1</b>		Document No:		20005-GEN-G-DOC-9128
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## 1. PAINTING WORKS

Format No. : QAP.CONST/P/01



Sl. No	Activity Description	Contractor	PMC
1	Supplier material test certificate.	WC	Rw
2	Confirm completion of		
	a. Hydro testing of pipe.	WC	Rw
	b. Mechanical clearance of structure & equipment's.	WC	Rw
3	Performance test of paint & applicator.	WC	W
4	Check surface preparation.	WC	S
5	DFT after each coat.	WC	S
6	Inspect painting film thickness.	WC	W
7	Visual inspection of painting surface & its repair for equipments & piping.	WC	W
8	Identification, colour bands, direction marking.	WC	S
9	Acceptance.	WC	HP
	<u>INSPECTION &amp; TEST DOCUMENTS.</u>		
	Review Test and Inspection Documents.	HP	Rw

### ABBREVIATIONS

NDT	: Non Destructive Testing
WPS	: Welding Procedure Specifications
U/G	: Under Ground
PT	: Penetrant Testing
MT	: Magnetic Particle Testing
PWHT	: Post Weld Heat Treatment



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	<b>Subsection – A-1.3</b>		Rev :		0

- HP** : Hold Point  
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- Rw** : Review of CONTRACTOR's Documentation
- S** : Surveillance Inspection by OWNER/PMC  
Monitoring or making observations to verify whether or not material/items or services conform to specified requirements. Surveillance activities may include audit inspections, witness of testing, review of quality documentation & records, personnel qualifications etc.
- WC** : 100 % Examination by CONTRACTOR.

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – VI</b> INDICATIVE INSPECTION & TEST PLAN FOR INSULATION WORKS	Tender No :		3200000590
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**ATTACHMENT – VI**  
**TO**  
**REQUIREMENTS OF CONSTRUCTION QUALITY MANAGEMENT/  
QUALITY CONTROL**

**INDICATIVE INSPECTION & TEST PLAN FOR INSULATION WORKS**

 <b>ONGC</b> एन ओ एन पी एल <b>MRPL</b>	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>			 <b>nauvata</b> ENGINEERING SOLUTIONS	
	<b>Part – A</b>	<b>ATTACHMENT – VI</b> INDICATIVE INSPECTION & TEST PLAN FOR INSULATION WORKS	Tender No :		3200000590
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	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	<b>ATTACHMENT – VI</b> INDICATIVE INSPECTION & TEST PLAN FOR INSULATION WORKS	Tender No :		3200000590
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## 1. INSULATION WORKS

Format No. : QAP.CONST/IN/01



Rev : A

Sl. No	Activity Description	Contractor	PMC
1	PRIOR TO APPLICATION OF INSULATION		
a	Test certificates from supplier of insulation material and acceptance thereof.	WC	Rw
2	DURING APPLICATION OF INSULATION		
a	Surface preparation.	WC	S
b	Fixing of spacer rings and checking their spacing.	WC	S
c	Fixing of support rings and checking their spacing in case of vertical piping	WC	S
d	Fixing of insulation lugs and angle rings in case of vessels, tanks, etc.	WC	S
e	Thickness of insulation.	WC	S
f	Overlap of cladding at vertical and horizontal joints.	WC	S
g	Expansion joints, if any.	WC	S
h	Inspection windows.	WC	S
i	S.S. foil for S.S. Piping.	WC	S
j	Final finish.	WC	W
3	ADDITIONAL CHECK FOR COLD INSULATION.		
a	Wooden supports.	WC	S
b	Vapor Barrier	WC	S
c	Vapor Sealant	WC	S
d	Insul coat.	WC	S
	<b><u>INSPECTION &amp; TEST DOCUMENTS.</u></b>		
	Review Test and Inspection Documents.	HP	Rw

	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
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**ABBREVIATIONS**

NDT	:	Non Destructive Testing
WPS	:	Welding Procedure Specifications
U/G	:	Under Ground
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MT	:	Magnetic Particle Testing
PWHT	:	Post Weld Heat Treatment
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<b>A-2</b>	<b>PLANNING, SCHEDULING AND MONITORING PROCEDURE</b>
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## MRPL Marketing Infrastructure Projects, Mangalore

**PROJECT :** Marketing Infrastructure Projects, MRPL



**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** Nauvata Engineering Pvt. Ltd.

**JOB NO. :** JBG20005



1	10-May-2021	Issued for Bid	SP	ASN	ASN
0	09-Mar-21	Issued for Bid	SP	ASN	ASN
Rev. No.	Date	Description	Prepared By	Checked By	Approved By





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## 1.0 OVERVIEW

- 1.1 Mangalore Refinery & Petrochemicals Ltd (MRPL) operates a 15 MMTA crude processing refinery with secondary units and Petrochemical complex at Mangalore. MRPL proposes for tank conversion and associated construction works at MRPL refinery site.
- 1.2 The proposed modification would cater to requirements of transferring petroleum products from Mangalore to Marketing terminal at Devangonhi.

## 2.0 INTRODUCTION

This document 'Project Control Requirements', for the following Project control activities: Planning, Scheduling, Progress Measurement and Reporting for LSTK Tender A.

The CONTRACTOR shall develop project specific procedures to cover all Project Planning, Scheduling and Reporting activities well before the start of the relevant activities. PMC / MRPL shall receive all the procedures for comments and approval. CONTRACTOR shall then implement the procedures during the execution of the Project.

## 3.0 DEFINITIONS AND ABBREVIATIONS

### 3.1 DEFINITIONS

For the purposes of this specification, the following definitions shall apply.

OWNER – MRPL (Mangalore Petrochemicals & Refinery Ltd.)

PMC – Project Management Consultant (Nauvata Engineering Pvt. Ltd.)

CONTRACTOR – a party contracted to MRPL to carry out work or services to the Project.

FIELD Services – is CONTRACTOR'S performance of construction and commissioning at the SITE

SITE – geographical area designated for MRPL Marketing Terminal at Devangonhi, Bengaluru

HOME OFFICE Services – is CONTRACTOR's performance of procurement and construction services

PROJECT – means the Setting up of MRPL Marketing Terminal at Devangonhi, Bengaluru



SHALL AND MUST – indicates a mandatory requirement

SUBCONTRACTOR – means any sub-supplier of any tier on whom the Vendor has directly or indirectly placed a suborder. If used in a Purchase Order the term sub-supplier shall have the same meaning as Subcontractor

VENDOR – means the firm, company or other corporate entity (including its successors and / or permitted assigns) contracted through a Purchase Order

CONTRACT – means the CONTRACT between the CONTRACTOR / VENDOR and MRPL for the supply of the equipment / Services

TREND – is defined as a potential alteration in work scope or process which will result in a change

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VARIATION – variation is defined as any and all changes in or relative to the services, and amendments to the Agreement

CONTRACT TREND NOTICE – is the formal documentation that records the trend basis, scope, cost and schedule

### 3.2 ABBREVIATIONS

MC - Mechanical Completion  
RFSU – Ready for Start Up  
WBS – Work Breakdown Structure  
FOB – Free On Board  
CPM – Critical Path Method  
ROS – Required On Site  
MS – Motor Spirit  
HSD – High Speed Diesel  
ATF – Aviation Turbine Fluid  
MRPL - Mangalore Petrochemicals & Refinery Ltd.

### 4.0 PROJECT CONTROL AND REPORTING

CONTRACTOR shall provide the project schedule, milestones and project schedule narrative in accordance with the Project Control requirements, and tender documentation.

CONTRACTOR shall note that the Schedule and the Milestones submitted by the CONTRACTOR shall form part of the CONTRACT.

CONTRACTOR shall provide Schedules, Histograms, Progress Measurement System, and Progress ‘S’ Curves, as covered in sections 5 and 6 as a part of bid document.



CONTRACTOR shall provide the following Project Control documents upon award of project:

- Progress Measurement System
- Schedule – Level 1 and 2
- Milestones – key milestones for Procurement, Construction, Commissioning, Hydraulic Guarantee and Closeout
- Schedule Narrative
- Progress ‘S’ Curves
- Procurement Tracking Schedule
- Manpower Histogram for Home Office Services
- Manpower Histogram for Construction Works
- Construction Plant / Equipment Deployment Schedule
- CONTRACTOR shall provide a statement of compliance with PMC / MRPL’s Project Control requirements and associated procedures

Description of CONTRACTOR’S Project Control Organisation

- Contractor shall provide a description of the Project Control organisation, its main functions, and the responsibilities and duties of the principal assigned individuals, including their CV’s. This shall include the Planning, Scheduling, Progress Control, Cost Control and Reporting functions as a minimum. Description shall explain how the organisation will ensure the integration of Project Control function between the Home Office, other WORK locations, the SITE, SUBCONTRACTORS and VENDORS.

Description of Contractor’s Project Control procedures/ systems

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- CONTRACTOR shall submit details of its proposed Planning, Scheduling and Progress Measurement and Progress Reporting procedure, along with the unpriced technical offer.

Description of CONTRACTOR'S Project Control computer software/ applications

- CONTRACTOR shall use PRIMAVERA (P6.0 or later) computer software / applications for Planning, Scheduling, Progress Control and Reporting.

Description of CONTRACTOR'S Document Control and Materials Management interfaces with Project Control systems

- CONTRACTOR shall provide a description of how CONTRACTOR'S Document Control and Materials Management functions interface with the planning and progress measurement and payment systems within the Work Breakdown Structure and Organisation Breakdown Structure. CONTRACTOR shall provide sample reports from the systems proposed.

## 5.0 PROJECT PLANNING REQUIREMENTS

The Scope of Project Planning, Scheduling and Monitoring Services to be performed by CONTRACTOR shall include, but not be limited to the functions as described under the following.

- Planning
- Scheduling
- Monitoring
- Updating
- Reporting

CONTRACTOR's Project Planning team shall be responsible for submitting CONTRACTOR's project Planning, scheduling and Monitoring procedures, establishing project measurement systems, and mobilising a suitably qualified and experienced project control team to execute the project Planning, Scheduling, Monitoring and reporting requirements. CONTRACTOR shall use computerised systems to the maximum extent possible for the Project Planning, Scheduling, Monitoring and Reporting Services. Such systems shall be capable of electronic interface between CONTRACTOR's Home Offices and SITE and PMC / MRPL offices. CONTRACTOR shall provide PMC / MRPL with access to Planning & Scheduling data as requested. CONTRACTOR shall also provide PMC / MRPL, as required, with updated Schedules, networks, planning and Change databases via electronic and hard copies throughout the duration of the Project. CONTRACTOR shall develop detailed procedures for each of the functions described in this section for review and approval by PMC / MRPL. Procedures shall be completed and submitted for PMC / MRPL approval within **Two (2) weeks** of Contract award.



## 6.0 PROGRESS PLANNING, MEASURING AND REPORTING

The purpose of this section is to define the PMC / MRPL's requirements for the CONTRACTOR'S method of planning and scheduling. It is provided to the CONTRACTOR as a guideline for the specification and definition of the PMC / MRPL's minimum requirements for the works. CONTRACTOR is to use this guideline to develop the procedure required for PMC / MRPL's approval.

- Planning and Scheduling
- Progress Planning
- Progress Measurement
- Progress Reporting
- Progress Review and Certification

### 6.1 PLANNING AND SCHEDULING

#### 6.1.1. Planning Hierarchy

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CONTRACTOR shall use, as a minimum, the following hierarchical basis for planning and scheduling. This shall apply to both Design office and Field planning efforts, and conform to the following structure.

- Level 1 - Project Management Schedule
- Level 2 - Master Schedule
- Level 3 - Procurement and Construction CPM Network
- Level 4 - Registers

#### 6.1.2. Level I - Project Management Schedule

The Level I Project Management Schedule shall be in sufficient detail to demonstrate how the CONTRACTOR plans to execute the WORK within the Milestone dates. It shall be based on the CONTRACTOR'S approved WBS structure and shall identify the Major Project Milestones.

Additional activities, key dates and interfaces shall be shown where this aids the demonstration of critical or high-risk elements of the WORK.

The Level I Project Management Schedule shall include construction and commissioning activities in sufficient detail to demonstrate how CONTRACTOR expects construction and commissioning activities to be planned based on FOB delivery of equipment and materials.

Typically, the Level I Project Management Schedule shall be a logical presentation on a single sheet, suitable for reduction to A3 or A4 format, containing 50 to 60 lines. It shall summarise for each Level I WBS element the main phases of the Level II WBS. The format of the Level I Project management schedule shall be agreed with PMC / MRPL.

The Level I Project Management Schedule shall be front lined with a status line representing the remaining duration of the activities in progress determined from the lower level schedules. The Level I shall be included in the monthly progress report.

Once established as a baseline, the Level I schedule shall not be changed without PMC / MRPL approval. Actual and forecast variances from the schedule shall be shown clearly in a format acceptable to PMC / MRPL.

#### 6.1.3. Level 2 – Master Schedule



The SCHEDULE submitted along with the Tender, shall be updated to reflect the modifications agreed with PMC / MRPL prior to award of CONTRACT and the actual effective date for the Project. This will become the Master Schedule.

#### 6.1.4. Level 3 – Procurement and Construction CPM Network

A Level III schedule in the form of detailed precedence CPM networks and based on the approved WBS shall be prepared by CONTRACTOR and submitted for PMC / MRPL review within **Four (4) weeks** of CONTRACT award. Once agreed with PMC / MRPL, this schedule shall be “baselined” and set as a target against which CONTRACTOR shall compare all subsequent reporting.

The Level 3 CPM Network shall be based on the Contract Master Schedule for the WORKS and shall be in greater detail to reflect the milestones sequence and inter-relationships between various activities and sub-activities related to each Area / Phase / Discipline of work. The Network / Bar chart shall ensure integration of procurement & delivery, subcontracting, construction, pre-commissioning, commissioning, closeout and all other activities required for completion of the WORK in line with PMC / MRPL priorities and agreed sequence. Responsibilities and resources



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required to carry out the execution of each activity shall be identified. The Network / Bar Chart shall be construction driven and shall include all sub-activities up to the lowest level, under each category/group of activities by Area / Phase / Discipline etc. as per the scope of work. The Network shall be coded to highlight all external interface requirements outside the control of the CONTRACTOR. These interface activities shall be updated along with each schedule update cycle and any changes with regard to their availability shall be communicated to PMC / MRPL along with their impact if any.

The integrated time scaled logic network which will be prepared by using 'PRIMAVERA' software shall be self-explanatory and the activity coding structure shall provide reference to Area / Phase / Discipline / Subcontract etc. as per the approved Work Breakdown Structure (WBS) to enable effective organizing and report sorting. Activity coding structure shall also enable filtering of all activities / sub activities related to the following:

- Interface activities
- Procurement and Construction activities related to long lead items (LLIs)
- High Risk / Critical Activities (< 2 weeks float)
- Milestones

CONTRACTOR shall continue to develop and maintain the Detailed Schedule throughout the procurement and construction period, taking into consideration latest philosophies, strategies, design, material, access and manpower requirements. The Detailed Schedule shall also be used by CONTRACTOR as the prime vehicle for constructability planning exercises such as heavy lift crane movements scheduling etc.

The extent of detailing of the Schedule shall meet PMC / MRPL requirements such that the effect of any significant delay or change in the course of the execution of the WORKS can be clearly explained, evaluated and controlled. CONTRACTOR will, on request by PMC / MRPL, expand the Schedule logic in key areas, and provide copies of logic diagrams and Schedule reports for all or any part of the Detailed Schedule.

#### 6.1.5. Level 4 - Registers

The control tools included in this level are primarily documents used to track and measure progress of the work at an identifiable deliverable level including, but not limited to, the following:

- Procurement Status Reporting
- Subcontracts Schedule
- Three Week Look ahead Schedule
- Systems Completion Schedule



#### 6.1.6. Three Week Look ahead

During the Construction phase, Three-week Look-Ahead Schedules shall be prepared for all disciplines, to indicate specific items of work to be accomplished over the forthcoming three weeks and activity completed in the previous week. This Schedule shall form part of CONTRACTOR's Weekly Progress Report and updated weekly. This Schedule shall clearly show any internal or external information flow or decision constraints that are hindering progress.

#### 6.1.7. Systems Completion Schedule

CONTRACTOR shall prepare a SYSTEMS Completion Schedule for review and approval by PMC / MRPL. The SYSTEMS Completion Schedule will be used to establish MECHANICAL COMPLETION (MC), READY FOR COMMISSIONING (RFC) and READY FOR START-UP (RFSU) dates for each SYSTEM and will supplement the Detailed Schedule as the working tool.



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The SYSTEMS Completion Schedule will be put in place prior to the transition to SYSTEMS Completion in the FIELD and must support the requirements of the agreed START-UP Schedule.

#### 6.1.8. Minimum Requirements for Scheduling

LSTK Contractor shall follow below mentioned minimum requirements while preparing the Detail Schedule.

1. Schedule shall be developed using Precedence Diagram Method.
2. Schedule shall be built using logical sequencing of activities.
3. Duration of any activity shall not exceed more than 40 days.
4. Lag / Lead shall not exceed more than 20 days.
5. Start to Finish (SF) linkage shall not be used while developing the schedule.
6. Hard Constraints shall not be used while developing the schedule. Only Soft Constraint shall be used.
7. All activities shall have at least one predecessor and one successor activity as a minimum except for Project Start and Project Finish Activities.
8. Schedule shall be resource loaded.
9. All Long lead items shall be identified and scheduled so that receipt of such long lead items at site is on time so as not to affect downstream activities.

#### 6.1.9. Critical Path

LSTK Contractor shall identify all the critical paths on the project while developing the Baseline Schedule. All activities with float < 2 weeks shall be considered as Critical activities. Any change in the critical paths along with its impact on the overall Project completion shall be highlighted to PMC / MRPL by Contractor immediately during the project execution. A narrative shall be furnished indicating the reasons for variation of critical path, the critical activities, the reasons thereof and remedial / additional measures proposed to be taken to bring back the project on to the original critical path and any assistance needed by the PMC / MRPL. Any hindrances which may affect the work / Critical path may be notified to PMC / MRPL in advance. The status of critical activities which may affect the critical path needs to be identified at least a week in advance and initiate corrective / preventive actions under intimation to the PMC / MRPL. Any corrective actions by PMC / MRPL also needs to be anticipated and informed at least a week in advance to provide sufficient time for corrective / preventive actions.



#### 6.2 REVISION OF PLANNING AND SCHEDULING DOCUMENTS

CONTRACTOR shall use appropriate software and computerised systems, which will be flexible enough to accommodate any changes in the scope of WORK, basis of scheduling and reporting etc. However, all such changes will be reflected in the Planning and Scheduling documents only after PMC / MRPL approval.

CONTRACTOR shall note that the submission of revised programmes by the CONTRACTOR and subsequent approval of the same by PMC / MRPL during the period of PROJECT implementation shall not relieve the CONTRACTOR from his Contractual obligations. All such revisions shall only be treated as a part of the control mechanism for effective monitoring so as to arrest/minimize progress slippages during the period of implementation.

#### 6.3 GENERAL REQUIREMENTS

CONTRACTOR shall submit to PMC / MRPL updated Level 1 Project Management Schedule, Level 3 Procurement and Construction CPM Network and all other Working Schedules in requisite copies along with soft copies of the same at the time of initial submission as well as during periodic updation. All soft copies shall be in their native formats (not in pdf. Formats). Contractor shall also in addition refer to Documentation requirements stated elsewhere in the tender documents.

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#### 6.4 REVIEW TIME FOR PLANNING AND SCHEDULING DOCUMENTS

PMC / MRPL shall require ten (10) working days for review of all Planning and Scheduling related documents. CONTRACTOR shall accommodate for this duration in the Level III CPM Schedule.

#### 7.0 PROGRESS PLANNING

Throughout the duration of the WORK, CONTRACTOR shall establish and report against a series of progress control curves and equivalent manpower histograms. The baseline curves shall show the planned monthly progress, and be developed using planned dates from the Level III schedule. During the execution of the WORK, the actual weekly and monthly progress shall be compared with the planned.

The CONTRACTOR shall develop a method for the measurement of physical progress to report actual progress against a series of progress control curves. CONTRACTOR is required to develop the detailed progress measurement system based on this procedure. Once approved, the progress control curves and associated weightage will remain fixed unless changes are approved by OWNER.

CONTRACTOR shall provide PMC / MRPL with unlimited access to CONTRACTOR's progress measurement data for the purposes of verification of progress through all phases of the WORK as required in the Progress Review and Certification Procedure.

#### 7.1 LEVEL I PROGRESS S-CURVES

##### 7.1.1. Overall Progress S-Curves

Overall progress curves shall be developed to monitor progress of the WORKS. The curves shall be based on the approved SCHEDULE and weighted in accordance with PMC / MRPL's progress weightage, refer Section 6. Progress figures shall be shown in graphical and tabular format and compare actual progress with the planned progress baselines. Contract progress curves shall be prepared for the following:

- Overall Progress
- Procurement and Subcontracting Progress
- Overall Construction Progress
- Overall Commissioning progress

##### 7.1.2. Manpower Histograms

Manpower histograms shall be developed showing the planned manpower for the entire duration of the WORKS, separately for Procurement & Subcontracting, Construction, Pre Commissioning & Commissioning and overall. Actual mobilised manpower shall be indicated to show comparison with plan. In the case of major rescheduling of the WORKS, the revised manpower loading shall be based on any agreed changes to the Master Schedule.

#### 7.2 DETAILED PROGRESS S-CURVES



##### 7.2.1. Progress Curves

Based on the Summary Schedule, CONTRACTOR shall provide Progress Curves showing planned, actual and forecast data for each of the following.

Procurement, Subcontracting and Expediting Services

- Equipments / Items / Materials
- Bulk Materials

Construction progress curves

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- Major Discipline
- Subcontract
- Area / Unit

Completion progress curves

- Pre Commissioning
- Commissioning

#### 7.2.2. Manpower Histograms

For each of the Detailed Progress S-Curves CONTRACTOR shall prepare compatible manpower histograms. For Construction, histograms shall be prepared showing trades within a subcontract. During the execution of the WORK, the actual equivalent staffing shall be compared to the planned and a forecast shall be produced to support any progress curves as necessary. Equivalent staffing calculations shall be based on the standard working hours/week at the work location.



#### 7.2.3. Construction Manpower Schedule

CONTRACTOR shall submit in the Monthly Report the “Construction Manpower Schedule” along with “Manpower Histogram for Construction Works” in a tabular form as per the formats enclosed in Attachments 4 & 5.

Construction works (Field activities) also include activities related to workshop, fabrication yard and other activities.

CONTRACTOR shall note the following requirements while preparing the details in the above formats.

- Designations indicated in the enclosed formats are only indicative and may be changed as required, to suit to CONTRACTOR’s own Organization Structure. However, CONTRACTOR shall not change the grouping of personnel identified in the above formats.
- Designations and number of persons indicated in the Proposed Organization Chart, Manpower Schedule and all other related documents shall be identical.
- “Direct Manpower (Field Supervision staff)” shall include all Engineers (Supervisory personnel), who are directly involved in the supervision of construction and pre-commissioning works as well as yard activities etc. (viz. Construction Manager, Engineers, Superintendents and other Engineers connected with Construction and Pre-commissioning, Survey, HSE, QA/QC etc.) Manpower details shall be furnished separately against each discipline (viz. Civil, Piping, Mechanical, Electrical, Instrumentation etc.)
- “Direct Manpower (Non-Supervisory staff)” shall include all Non-Supervisory personnel below the level of Foremen (including Foremen) who are directly involved in the field activities (viz. Foremen and below including skilled / semi-skilled / unskilled workmen, Equipment Operators, Heavy Equipment Drivers, etc.).
- Indirect Manpower (Field Management) shall include all personnel who are essentially office based and are not directly involved in the construction supervision activities (viz. Project Manager, Project Control Engineers, Procurement / Material Control/ Expediting Engineers, Contract / Subcontract Administrators / Engineers, Field Engineering Personnel, Warehousing personnel etc.)
- Subcontractor manpower shall be indicated separately against each of the proposed subcontracts (if any)

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- Other Office Staff including Administration / Personnel, Finance / Accounts and Camp staff (Viz. catering, maintenance, janitorial services, etc.) shall not be included in the Manpower Schedule.
- Construction Manpower Schedule shall reflect only the Manpower required for construction services, including subcontractors' manpower (separately against each subcontract) and Vendor Engineers if any, for the entire duration of project.

### 7.3 PROGRESS MEASUREMENT SYSTEM

Progress S curves identified in the sections above shall be updated with progress and issued within the Monthly Reports.

CONTRACTOR is to submit the proposed progress measurement system that will be used throughout the duration of the project.

CONTRACTOR is to establish suitable computer software to track and update the status of each deliverable, with the ability to roll up progress to the respective reporting levels. CONTRACTOR's progress measurement system shall satisfy at the least the criteria contained within 6.4 and 6.5.

### 7.4 PROJECT PROGRESS WEIGHTAGE

The overall weightage established will remain fixed unless there are changes in total work scope of a large magnitude, or the basis originally assumed is agreed to have changed significantly. Any change will require PMC / MRPL's approval prior to implementation.

Overall Progress Weightage Physical progress shall be assessed for the total scope of the WORKS, i.e. Procurement & Subcontracting, Construction, Pre commissioning & Commissioning, As-built and Project Closure.

Weightage for Procurement & Subcontracting, Construction, Pre commissioning & Commissioning, As-built and Project Closure are to be tabulated as given below. Weightage shall be evaluated based on either estimated man-hours or costs by CONTRACTOR and shall be approved by OWNER before implementation.

CATEGORY	WEIGHTAGE (%)
Procurement, Subcontracting & Expediting	
Construction	
Pre Commissioning and Commissioning	
As built	
Project Closeout	
Overall	

### 7.5 PROGRESS MEASUREMENT SYSTEM



CONTRACTOR's Progress Measurement System shall establish suitable tools to track and measure the progress of the work.

### 7.6 PROCUREMENT

CONTRACTOR shall report progress for raising requisitions and awarding subcontracts with progress, equipment fabrication and supply of bulks to receipt of items at site.

#### 7.6.1. Procurement Register

The Procurement Register shall track all Goods / Equipments / Materials / Items / Bulks for the Works, from RFQ stage through Purchase Order issue, Material Shipment and Receipt at jobsite.

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For each requisition the Required On Site (ROS) date shall also be established based on the Detailed Schedule and the requirement dates incorporated for each stage of the procurement chain up to placement of order and receipt of vendor data. Actual dates shall be shown for each stage to show progress accomplished, and wherever Schedule dates cannot be met, a forecast shall be indicated.

Where a forecast date exceeds the ROS date, a recommended recovery plan shall be indicated by CONTRACTOR. Such system shall also be capable of producing summary reports to meet PMC / MRPL's requirements. It shall also provide the means to review the status and evaluate potential project schedule delays on account of material delivery.

Guidelines for the format of these reports are provided in Attachments 9 and 10.

#### 7.6.2. Procurement Progress Evaluation

Procurement Services progress will be evaluated at the Control Level by weighting each Material Requisition (MR) by the estimated cost of Equipment / Item / Material and monitoring progress from a series of progress milestones from RFQ through to close-out.

Distribution of percentage at various stages of procurement for each individual Material Requisition will be kept same, for calculating procurement progress. The number of Requisitions / Purchase Orders shall be estimated initially and will be updated as the Procurement Plan is finalized.

A fixed milestone and percent complete pattern shall be determined for each Material Requisition / Purchase Order, starting with Prequalification stage and finishing with Purchase Order close-out as detailed in the following table. Progress against each Material Requisition will be measured under various major stages.

Description	Equipments	Bulk Materials
Issue MR / RFQ to Vendors	20%	20%
Issue Final TBE	30%	30%
Place PO on Vendor	40%	40%
Vendor Drawings Approval Completion	50%	-
FAT Successfully Conducted	85%	85%
Dispatch from Vendor's Premises	90%	90%
Receipt of Material at Site	100%	100%

#### Subcontracts Schedule



The Subcontract status report shall show for all subcontracts the required dates for the key stages of the subcontract chain and track progress from initial prequalification stage through award of subcontract. The number and types of subcontract shall be determined as part of the Subcontracting Plan.

Guidelines for the format of these reports are provided in Attachment 11.

#### Subcontract Progress Evaluation

CONTRACTOR shall distribute the total budgeted man-hours for subcontracting services and each contract shall be assigned a weighted value based on the complexities. Achieved progress shall be reported based on the progress milestone pattern and fixed percent completions for all milestones as detailed in the following table. Progress shall be evaluated by monitoring each SUBCONTRACT package according to milestones.



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Issue RFQ to Subcontractors	35%
Bid Analysis and Clarifications	90%
Subcontract Award	100%

## 7.7 CONSTRUCTION PROGRESS

The Construction / Pre-Commissioning / Mechanical Completion / Commissioning Progress measurement basis shall be developed by CONTRACTOR and submitted for PMC / MRPL's approval.

A detailed Construction Progress Measurement System shall be developed by CONTRACTOR in such a way that physical progress can be reported both by area or discipline or by subcontract. CONTRACTOR shall prepare back-up documentation such as quantities / resources, etc to support the suggested weightage. In each area physical quantities of work involved shall be indicated. Additional guidelines are provided in Attachments 15 & 16 to this procedure.

Pre-Commissioning / Commissioning Progress Measurement shall be developed and weighted on a system basis, and provided for PMC / MRPL's review and approval.

## 7.8 COMMISSIONING PROGRESS MONITORING

At a mutually agreed stage of the construction Schedule, CONTRACTOR shall transition from Area / Unit erection to a Systems approach. Suitable tools to plan and control the transition shall be in place prior to the move to Systems. CONTRACTOR's field progress reporting system shall be capable of measuring and reporting progress on a discipline basis for the defined Systems.

7.8.1. START-UP Schedule and Systems Completion Schedule  
Requirements for these schedules are contained within the Planning and Scheduling Procedure.

7.8.2. Punch List Reporting  
CONTRACTOR shall prepare and maintain a databased punch-listing system that incorporates all punch list items from the start of Discipline Acceptance, to control punch lists and system exception lists as part of the process for Acceptance of the Work.

## 8.0 PROGRESS MEASUREMENT



### 8.1 GENERAL

Throughout the duration of the WORK, CONTRACTOR shall develop, maintain, update and report against a series of progress control curves and manpower histograms. The baseline curves shall show the monthly planned vs. actual progress, which shall be generated directly from the approved schedules and shall form the basis of the physical progress measurement system. During the execution of the WORK the actual monthly progress shall be compared with the planned. A forecast shall be introduced if there is any negative deviation from the plan.

### 8.2 Procurement Progress

Progress shall be a measure of the completion of each step in the procurement plan. A percentage completion shall be established for each step in the procurement chain through to delivery at the work site. The relative weightage, based on value, shall be allocated to all Equipment / Items / Materials and Bulk Material orders defined in the Material Control System. The progress for each order shall be aggregated to the appropriate summary level.

## 8.3 CONSTRUCTION PROGRESS

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Progress achieved is the measurement of progress on individual activities based on the achievement of interim progress milestones for the activities, and/or actual quantities of work installed by the CONTRACTOR. The milestones are a guide for progress, and credit is given to work that has progressed beyond a milestone, but has not yet achieved the next milestone. The earned values shall be accumulated by material type, plant area, to calculate actual progress percentages at the different levels of detail, with the figures rolling up to a total project actual percent complete.

## 9.0 PROGRESS REPORTING

CONTRACTOR shall prepare and issue Monthly Progress Reports and Weekly Progress Reports to inform PMC / MRPL of the status of the WORKS.

Reports shall be issued both in hard copy and electronic format.

CONTRACTOR shall report to and discuss with PMC / MRPL the status of the WORKS at Weekly Progress meetings, Monthly Progress Meetings and Review Meetings as required.

These reporting requirements shall not relieve CONTRACTOR of its obligations to promptly report to PMC / MRPL any matters that significantly affect completion of the WORK. CONTRACTOR shall provide adhoc report and/or presentations as required by PMC / MRPL to address specific issues eg. action plans to recover schedule slippage. Reports requested by PMC / MRPL and not contained within the body of the Monthly Report shall be issued either by electronic transfer or by covering transmittal.

## 9.1 MONTHLY PROGRESS REPORT



The Monthly Progress Report shall be issued to PMC / MRPL each month, with 15<sup>th</sup> calendar day of every month as cut off. Report shall be issued within 2 working days from this cutoff date. Formal monthly progress meetings will be held at which CONTRACTOR will be expected to make presentations highlighting achievements, problems and recovery measures, as recorded in the Monthly Report.

CONTRACTOR is required to prepare the report with an Executive Summary and detailed sections as defined below:

- Executive Summary
- Detailed Report
- Overall Safety / HSE
- Procurement Services
- Subcontracting Services
- Construction
- Pre-commissioning / Commissioning
- Quality
- Areas of Concern
- Progress Photographs

Executive Summary, shall include

- Summary narrative highlighting major activities accomplished during the month including Project Milestones achieved, progress achieved compared with plan, areas of concern and remedial actions.

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- Updated Project Level I schedule with analysis highlighting any delay in progress with particular reference to the project critical path and achievement of Project Milestones. Narrative shall describe any recovery actions required.
- Safety summary reporting achievements in the month, current objectives, and incident/accident statistics in a format to be agreed with MRPL's HSE department. Any serious incidents, results of investigations and remedial actions should be addressed in this section.
- Summary Progress Reports comprising;
  - Progress S-Curves updated with actual versus plan
  - Manpower histograms updated with actual versus plan
  - Quantity Reporting Summary showing the relevant key progress indicators for the stage of the project (refer below)
  - Summary status and progress for each subcontract
  - Summary of CONTRACT changes

Detailed Report, shall include

Each Detailed Report section shall contain a narrative of the major activities undertaken during the month, planned activities for the next month, areas of concern and recovery actions.

CONTRACTOR shall provide the following specific progress reports, with the respective sections:

#### 9.1.1. HSE

This section will highlight the activities in the area of HSE, and shall address key activities that have taken place during the month

- Narrative addressing for the month, actions taken to enhance and encourage HSE awareness.
- Tabulation of SITE HSE statistics, by subcontractor, in a format to be agreed with MRPL's HSE department.
- Statement of overall accident-free manhours for the WORKS.

#### 9.1.2. Procurement and Subcontracting Services

- Summary status for equipment and materials, represented as a comparison of the number of purchase orders planned/actual/forecast.
- Progress curves for overall Procurement Services, and split by equipment/bulks, showing planned, actual and forecast progress.
- Progress curves for overall Subcontracting Services.



#### 9.1.3. Construction

- Summary progress by major discipline and subcontract
- Progress curves for overall Construction, and for each area and subcontract, showing planned, actual and forecast progress.
- Construction manpower histograms, indicating direct/indirect labour, and plan versus actual, each subcontract.

#### 9.1.4. Pre-Commissioning/Commissioning

- Summary status by system showing the key stages of each system as it progresses from MC to RFSU.
- Progress curves for PRECOMMISSIONING and COMMISSIONING activities showing planned, actual and forecast progress.



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## 9.2 PROJECT CONTROLS

This section shall address planning matters, with particular reference to the overall Project Schedule. The cut-off date to be used in the preparation of data shall be as per the Project calendar.

### 9.2.1. Planning

- Narrative summary of the overall Project Schedule status with particular reference to slippages, critical path activities and other areas of Schedule sensitivity.
- Overall progress summary, curves and histograms for the WORKS, Procurement & Subcontracting, Construction, Pre Commissioning & Commissioning, As Built and Project Closure. Planned, actual and forecast progress shall be shown.
- Contract Master Schedule, updated for progress through the report period.
- MILESTONE status showing Scheduled/actual/forecast dates.

### 9.2.2. Quality

This Section will highlight activities in the area of Quality Control (QC) and Quality Assurance (QA) for procurement and field activities.

- Status of Audits
- Quality Control Report showing main activities, statistics and disposition of Non-Compliance Reports (NCR)
- Status of key QC indications, eg. compaction tests, concrete tests, NDE results (including welder qualification records and performance/rejection rates), pressure tests etc.

### 9.2.3. Areas of Concern

- Narrative of major areas of concern facing the Project, plus CONTRACTOR's proposed courses of action.
- Status of outstanding areas of concern and those cleared since the previous month's report.

### 9.2.4. Progress Photographs and 3D CAD views



CONTRACTOR shall take regular photographs of the WORKS as a record of its progress within the Monthly Report. Photographs shall be taken every month at a minimum of six locations to be directed by PMC / MRPL.

## 9.3 WEEKLY PROGRESS REPORT

The weekly progress report shall be submitted to PMC / MRPL on the first working day of the following week. The minimum contents shall be as follows:

- Brief narratives of the activities performed during the week by each discipline or in the case of construction each subcontract, with highlights on specific achievements.
- Areas of concern and proposed corrective action.
- Construction reporting shall include, equipment and bulk materials received, tables indicating planned and actual quantities for key construction indicators eg steelwork erected, equipment erection, piping erection, electric cable installed.
- Weekly man-hour summary table showing Home Office manhours expended for the week and actual manpower, or in the case of construction each subcontractors manhours expended for the week, to date, and actual site manpower.
- Major activities planned for next week.
- List of outstanding documents and correspondence requiring response by either PMC / MRPL or CONTRACTOR.

## 9.4 DAILY CONSTRUCTION REPORTS

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CONTRACTOR shall maintain a daily field log sheet giving a brief description of the WORK in progress. CONTRACTOR shall provide daily labour and equipment sheets detailing CONTRACTOR's, Subcontractors and vendors equivalent direct and indirect staffing by trade and major construction equipment employed, material received, key milestones achieved, lost time accidents and other major activities of the day.

#### 9.5 FINAL CLOSE-OUT REPORT

CONTRACTOR shall prepare a Final Close-out Report for the Works which shall be submitted to PMC / MRPL no later than one month after Provisional Acceptance. The format of the Final Close-out Report is to be agreed with PMC / MRPL no later than six (6) months prior to the planned Provisional Acceptance.

#### 9.6 PROGRESS MEETINGS

CONTRACTOR shall report to and discuss with PMC / MRPL the status of the Project Progress at Weekly Progress Meetings and Monthly Progress Meetings.

#### 9.7 WEEKLY PROGRESS MEETINGS

The main purpose of the Weekly Progress Meeting shall be to discuss the Weekly Progress Report. Particular attention shall be directed towards any recovery actions required. Other topics may be introduced at the request of PMC / MRPL or CONTRACTOR. The location, timing, attendees and agenda shall be agreed with PMC / MRPL.

#### 9.8 MONTHLY PROGRESS MEETINGS

The main purpose of the Monthly Progress Meeting shall be to discuss the Monthly Progress Report. Other topics may be introduced at the request of PMC / MRPL or CONTRACTOR. The location, timing, attendees and agenda shall be agreed with PMC / MRPL.

#### 9.9 SUBCONTRACTORS' AND VENDORS' PROGRESS MEETINGS

PMC / MRPL has the right to attend all progress meetings with Subcontractors' and Vendors' and shall be notified of such meetings and receive a copy of the minutes within four (4) working days of the meeting.

#### 9.10 RECORDS



CONTRACTOR shall maintain records of all weekly and monthly progress report statistics and supporting databases which shall be available to PMC / MRPL personnel.

#### 10.0 PROGRESS REVIEW CERTIFICATION

##### 10.1 PROGRESS DOCUMENTATION

CONTRACTOR shall perform progress measurement in accordance with Progress Planning Section 6.0. CONTRACTOR shall submit all supporting documentation for the progress claimed each month, to enable progress certification / approval by PMC / MRPL. Progress Review / Verification sheets to be submitted by CONTRACTOR shall cover the details of progress achieved during the month as per the details given below.

1. Physical Progress and Milestone Completion Certificate
2. Milestone Certificate
3. Milestone Summary Status
4. Overall Progress Summary
5. Procurement Progress
6. Subcontracting Progress
7. Construction Progress

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## 8. Commissioning Progress

Above details shall be submitted every month for progress certification as per the enclosed sample formats, Attachments 17 to 23. CONTRACTOR shall ensure that the MILESTONES achieved during the month are agreed by PMC / MRPL prior to submission of above details for progress certification.

### 10.2 REVIEW AND CERTIFICATION

PMC / MRPL shall return the above progress verification sheets to CONTRACTOR duly approved / certified, within 10 working days after receipt of same by PMC / MRPL with correct details. In case any portion of the progress claimed to have been achieved is found to be incorrect, the same shall be communicated by PMC / MRPL to the CONTRACTOR within 10 working days after receipt by PMC / MRPL, for necessary rectification and resubmission of above documents.

### 11.0 SCHEDULE CHANGE

#### 11.1 PROCEDURE

This procedure defines the system for identification of potential changes and approval of Schedule changes. Changes are to be prepared for events that potentially impact the cost, schedule and / or have detrimental impact on quality.

#### 11.2 CHANGE IDENTIFICATION

##### 11.2.1. Contractor Identified Changes

CONTRACTOR is required to promptly notify PMC / MRPL of potential changes to the CONTRACT scope through the Schedule Change system. CONTRACTOR documents the Schedule change, recording the change basis and change impacts on manhours, cost and schedule. The originator should clearly describe the Change and provide backup and reference documents including the relevant portion of the project specification that is affected. CONTRACTOR must notify PMC / MRPL of a Change within ten (10) working days of identification.

If during performance of services, CONTRACTOR is of the opinion that any instruction received from PMC / MRPL or any other developments affecting the services should be treated as a variation, CONTRACTOR shall notify PMC / MRPL in writing within five (5) days and shall await PMC / MRPL's further instructions.

##### 11.2.2. PMC / MRPL Initiated Trend

PMC / MRPL initiated changes will be communicated to CONTRACTOR under a Change Note. CONTRACTOR shall prepare the full Change assessment and submit for PMC / MRPL's review within ten (10) working days after receipt.

CONTRACTOR shall provide information on cost, schedule etc. on these Change Notes.

##### 11.2.3. Cost of Trend Preparation



The full cost of evaluating and processing of a Change notes, whether ultimately approved or rejected by PMC / MRPL shall be borne by the CONTRACTOR and shall not be reimbursed by PMC / MRPL.

##### 11.2.4. Schedule Effects

The trend section applicable to schedule will be completed by CONTRACTOR. CONTRACTOR shall endeavor to maintain the schedule as contained in the Baseline schedule.

In the event of a potential schedule deviation, CONTRACTOR shall evaluate the extent of change in any Milestone and/or Overall Completion Date.

PMC / MRPL requires CONTRACTOR to provide all relevant schedule data, related to the change, in order to demonstrate that the work cannot be executed within the agreed time frame.

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CONTRACTOR shall supply PMC / MRPL with a CPM Network including the basis for original and revised logic and durations.

### 11.3 **PMC / MRPL ASSESSMENT**

PMC / MRPL will perform an assessment of all Change Notes and raise clarifications to the CONTRACTOR if required. PMC / MRPL will then either, approve the Change Note and proceed to issue a Variation, or notify the change Note is rejected.

### 11.4 **IMPLEMENT CHANGE**

When CONTRACTOR has been notified of a Change, CONTRACTOR's Project Management will instruct the task force to proceed. CONTRACTOR will update the Change Log and revise the reports.







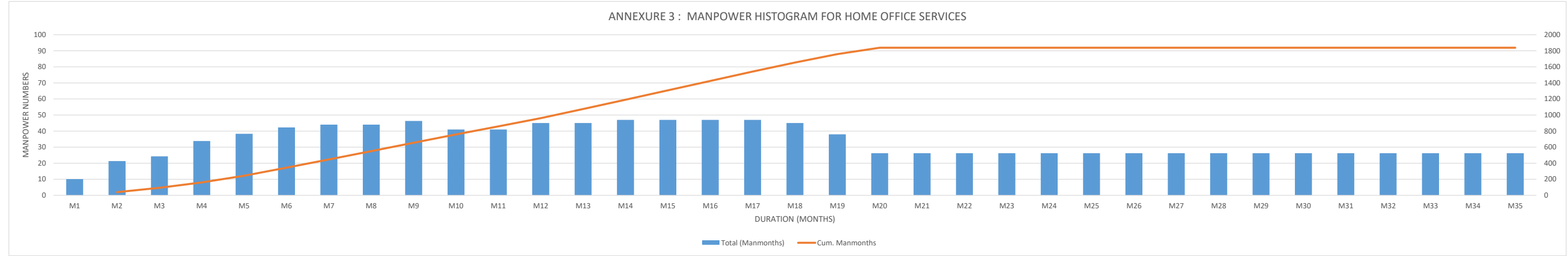
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Project Management Services	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6				
Procurement Services		2	4	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
Contracting Services	0	0	0	2	3	4	4	4	4	4	4	4	4	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
Construction & Commissioning Services	0.1	0.1	1.1	1.5	3	4	6	6	6	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Design/ Drafting Services	4	10	10	14	16	16	16	16	16	16	16	18	18	18	18	18	18	16	16	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
Document Control Services	2	3	3	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
Other services	1	0.2	0.2	0.3	0.3	0.3	0	0	2.3																														
<b>Total (Manmonths)</b>	<b>10.1</b>	<b>21.3</b>	<b>24.3</b>	<b>33.8</b>	<b>38.3</b>	<b>42.3</b>	<b>44</b>	<b>44</b>	<b>46.3</b>	<b>41</b>	<b>41</b>	<b>45</b>	<b>45</b>	<b>47</b>	<b>47</b>	<b>47</b>	<b>47</b>	<b>45</b>	<b>38</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>	<b>26.2</b>			
<b>Total (Manhours)</b>		<b>6681</b>	<b>9248</b>	<b>11271</b>	<b>14246</b>	<b>17051</b>	<b>17391</b>	<b>17680</b>	<b>17680</b>	<b>17170</b>	<b>17170</b>	<b>19550</b>	<b>19550</b>	<b>19890</b>	<b>19890</b>	<b>19890</b>	<b>19040</b>	<b>17850</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>	<b>13600</b>			
<b>Cum. Manmonths</b>		<b>39.3</b>	<b>93.7</b>	<b>160</b>	<b>243.8</b>	<b>344.1</b>	<b>446.4</b>	<b>550.4</b>	<b>654.4</b>	<b>758.4</b>	<b>859.4</b>	<b>960.4</b>	<b>1075</b>	<b>1190</b>	<b>1307</b>	<b>1424</b>	<b>1541</b>	<b>1653</b>	<b>1758</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>	<b>1838</b>			

The above is indicative only. Contractor may modify the list as per the Project scope and requirements







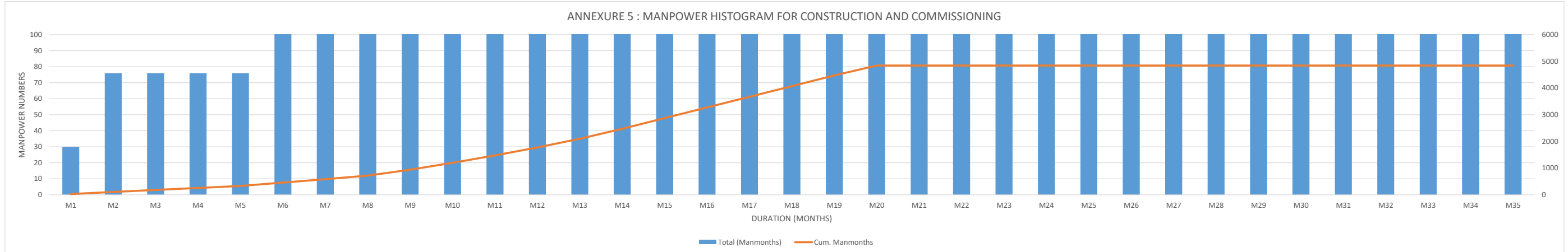
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Direct Manpower Nos ( Field Supervision Staff )	5	15	15	15	15	20	20	20	40	40	40	40	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	1435		
Indirect Manpower Nos ( Field Supervision Staff )	1	3	3	3	3	4	4	4	8	8	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	287		
Direct Manpower Nos ( Non Supervisory Staff )	20	50	50	50	50	70	75	80	120	140	160	180	200	220	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	6715	
Subcontractor Manpower Nos	0	0	0	0	0	20	20	20	40	60	60	60	60	80	80	80	80	80	80	80	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	1620	
Other Manpower Nos	4	8	8	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	336		
<b>Total (Manmonths)</b>	<b>30</b>	<b>76</b>	<b>76</b>	<b>76</b>	<b>76</b>	<b>124</b>	<b>129</b>	<b>134</b>	<b>218</b>	<b>258</b>	<b>278</b>	<b>298</b>	<b>330</b>	<b>370</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>370</b>	<b>10393</b>	
<b>Total (Manhours)</b>	<b>6600</b>	<b>16720</b>	<b>16720</b>	<b>16720</b>	<b>16720</b>	<b>27280</b>	<b>28380</b>	<b>29480</b>	<b>47960</b>	<b>56760</b>	<b>61160</b>	<b>65560</b>	<b>72600</b>	<b>81400</b>	<b>88000</b>	<b>88000</b>	<b>88000</b>	<b>88000</b>	<b>88000</b>	<b>88000</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>	<b>81400</b>		
<b>Cum. Manmonths</b>	<b>30</b>	<b>106</b>	<b>182</b>	<b>258</b>	<b>334</b>	<b>458</b>	<b>587</b>	<b>721</b>	<b>939</b>	<b>1197</b>	<b>1475</b>	<b>1773</b>	<b>2103</b>	<b>2473</b>	<b>2873</b>	<b>3273</b>	<b>3673</b>	<b>4073</b>	<b>4473</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>	<b>4843</b>			

The above is indicative only. Contractor may modify the list as per the Project scope and requirements





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ATTACHMENT 9: PROCUREMENT SERVICES STATUS REGISTER

Sl. No.	WBS Number	Discipline	Document / PO Number	Item / Material / Equipment Description	Weightage (%)	Plan / Act / For	Start RFQ / MR	Issue MR / RFQ to Vendors	Receive Vendor Offers	TQ / TQ Closure	Issue TBE for PMC / MRPL review	Receive PMC / MRPL Comments on TBE	Issue Final TBE	Vendor Nomination	Issue PS for PMC / MRPL review	Receive PMC / MRPL Comments on PS	Issue Final PS	Place PO on Vendor	Pre-Inspection Meeting	Receive & Approve Vendor Drawings	Ready for Inspection	FAT	Closure of Punch Points	Dispatch from Vendor's Premises	Receipt of Material at Site	Earned Progress	Plan (%)	Act (%)	Remarks	
Incremental Progress (%)																														
Cumulative Progress (%)																														
						Plan																								
						Act																								
						For																								
						Plan																								
						Act																								
						For																								
						Plan																								
						Act																								
						For																								
						Plan																								
						Act																								
						For																								

Note:  
a Weightages shall be based on the estimated cost of each item / material / equipment





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ATTACHMENT 11: SUBCONTRACTING SERVICES STATUS REGISTER



Sl. No.	Discipline	Item Description	Weightage (%)	Plan / Act / For	Finalise Bidders List		Issue Tender for Bid	Receive Bids	Submit Bid Evaluation to Company	Receive Company Approval	Award Sub Contract	Earned Progress	Plan (%)	Act (%)	Contractor's Name	Contract Completion Date	Remarks		
					Submission	Approval													
Incremental Progress (%)																			
Cumulative Progress (%)																			
				Plan															
				Act															
				For															
				Plan															
				Act															
				For															
				Plan															
				Act															
				For															
				Plan															
				Act															
				For															

Notes:

- a Weightages shall be based on the estimated manhours of each subcontract





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Attachment 15  
Guideline on Progress Measurement System for Construction

A Typical Example is as below.

This example illustrates the various progress levels interacting to formulate an overall progress figure, the lowest levels, levels 5 and below, will generally utilize standardised weightings that will be formulated in the manner shown below.

Level 1	Level 2	Level 3	Level 4	Level 5	Weightage (%)
Overall Construction					100%
	Main Construction				92%
		Civil			
		Structural			
		Piping			
		Mechanical			
			Tanks		
				Bottom Plates	
				Shell	
				Roof	
			Pumps		
			Miscellaneous Equipments		
		Electrical			
		Instrumentation			
	Pre Commissioning				3%
	Commissioning				3%
	As Built / Closeout				2%

General guidelines on weighting stages for level 5 and lower  
CONTRACTOR will develop progress weighting system for further levels (Level 5 onwards). CONTRACTOR will submit the proposed weightings for EMPLOYER review and approval prior to implementation. Weight factors for Level 5 onwards shall reflect Measurable Elements of works for each type of work. The Measurable Elements shall be weighted by manhours for each category of

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work to enable aggregation to the summary progress reporting levels.

The work volume of each Progress Measurable element shall be measured using appropriate Yard Sticks. Physical progress of the Work Element shall be obtained by dividing the work volume completed by the estimated total work volume. Typical examples of yard sticks are as below.



- number of piles installed
- m length of buried linepipe installed
- m<sup>3</sup> of concrete poured
- m<sup>3</sup> of soil excavated
- m length of trenching completed
- m<sup>2</sup> of paving
- tonnage of steelwork fabricated
- tonnage of steelwork erected
- number of pipe welds complete (qty or dia/ins)
- number, tonnage and meters of spools fabricated
- number, tonnage and metres of spools installed, straight pipe installed,
- number of field welds complete split by large bore, small bore, under and above ground.
- number and diametric millimetres of welds, by material type, passed and failed.
- number of equipment items installed.
- number of instruments and control elements installed and connected.
- m cable length installed and connected.
- m cable tray/rack installed
- metres of steam/electric tracing installed.
- number of hydrostatic tests complete.
- Number of systems flushed and reinstated.
- m<sup>3</sup> or m<sup>2</sup> of pipe length insulated.
- m<sup>2</sup> of area painted.
- number of loop checks completed

Some examples of level 5 progress stages

CONTRACTOR shall establish planned installation curves for the major categories of WORK as follows, based on the detailed schedule. During the construction phase, CONTRACTOR shall measure the physical progress made for its WORK and that of SUBCONTRACTORS

Equipment Foundation	
Excavation	15%
Formwork / rebar	40%
Concreting	40%
Strip Formwork &	5%
	100%

Building / Superstructure Concreting	
Formwork / rebar	60%
Concreting	35%
Removal of Formwork	5%
	100%

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Drainage	
Precast manholes	35%
Place manholes	15%
Drainage	50%
	100%

Precast Cable Trenches	
Precast Units	30%
Install precast units	20%
Completed Trench in precast	50%
	100%



Rotating Equipment Installation	
Install	15%
Level / Align	25%
Grout	15%
Coupling / Guards	35%
Testing & Precommissioning	10%
	100%

Spoiled Piping	
Fabrication	30%
Erection	30%
Weld out / bolt up	10%
Supports	5%
Testing	15%
Reinstatement	5%
Final Inspection	5%
	100%

Electrical Cabling	
Cable Laying / Pulling	60%
Termination	35%
Testing	5%
	100%



#### Construction Progress Evaluation

CONTRACTOR shall report each month both the productivity in terms of expended jobhours per unit of each WORK item installed and the actual quantity achievement against the quantity planned for each of the major categories of WORK. Performance factors, based on earned (or achieved) jobhours divided by actual (or expended) jobhours, shall be used by CONTRACTOR to demonstrate the performance of the WORK and to substantiate that adequate manning levels are being provided to meet the WORK schedule.

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Attachment 16  
Construction Quantities

Craft	Document Type	Units	Total Quantity	Installed Quantities			
				For the Month		Cumulative till Date	
				Planned	Actual	Planned	Actual
Piling	Piling	No.					
Civil	Concrete	m <sup>3</sup>					
	Paving	m <sup>2</sup>					
	Concrete Structures	Tons					
	Steel Fabricated	Tons					
	Steel Installed	Tons					
Mechanical / Piping	U/G Piping	LM					
	Spools Fabricated	No.					
	Spools Fabricated	DI					
	Spools Fabricated	LM					
	Spools Installed	No.					
	Spools Installed	LM					
	Straight Pipe Installed	No.					
	Straight Pipe installed	LM					
	Field Weld – Underground	No.					
	Field Weld – Large Bore	No.					
	Hydrostatic Tests	No.					
Equipment Installed	No.						
Electrical / Instrumentation	Instruments / Controls Installed	No.					
	Terminations	No.					
	Cable Tray	LM					
	Cable	LM					
Others	Systems Flushed	No.					
	Systems Re-instated	No.					
	Pipe Length Insulated	m <sup>2</sup>					
	Area Painted	m <sup>2</sup>					

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Attachment 17  
Physical Progress and Milestone Completion Certificate

Project Number				
Project Name				
Month				Invoice No.
Invoicing Period		Upto		Date

A. PHYSICAL PROGRESS

Description	Monthly Progress (%)	Cumulative Progress (%)
Progress Planned		
Progress Achieved (Actual)		
Variance = Plan – Actual		

B. MILESTONE SCHEDULE

1. \*MILESTONE SCHEDULED FOR COMPLETION DURING INVOICING MONTH

Milestone Reference	Description	Date Achieved	Transmittal Number	# Not Achieved or Comments

2. \*PRIOR MONTHS MILESTONES ACHIEVED DURING INVOICING MONTH

Milestone Reference	Description	Date Achieved	Transmittal Number	# Not Achieved or Comments

3. \*MILESTONES OUTSTANDING FROM PREVIOUS MONTHS

Milestone Reference	Description	Date Achieved	Transmittal Number	# Not Achieved or Comments

The above Milestones and Stated Approved Physical Progress are Confirmed as Correct.

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
PMC / MRPL

**Notes**

\*ADDITIONAL SHEETS TO BE USED IF NECESSARY

#COMPLETE IF APPLICABLE







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**ATTACHMENT 20: OVERALL PROGRESS SUMMARY**

Project Number	
Project Description	

Month	
Cutoff Date	



CATEGORY	WEIGHTAGE (%)	CUMULATIVE PROGRESS (%)		INCREMENTAL/ MONTH PROGRESS (%)		CERTIFIED		REMARKS
		PLAN	ACTUAL	PLAN	ACTUAL	BY	SIGN	
PROJECT MANAGEMENT & GENERAL								
PROCUREMENT & SUBCONTRACTING								
CONSTRUCTION								
PRE COMMISSIONING & COMMISSIONING								
AS BUILT DOCUMENTATION								
PROJECT CLOSURE								
<b>OVERALL</b>								

APPROVED BY	
SIGN	
NAME	
DATE	







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<b>A-3</b>	<b>CONTRACT CLOSING</b>
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**PROJECT : MARKETING INFRASTRUCTURE PROJECT**

**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**

**PMC : NAUVATA ENGINEERING PVT LTD**



**JOB NO. : JBG20005**

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## 1. GENERAL

Contractor after completing the works in all respects as specified elsewhere in the Tender documents, is required to complete the following activities as a minimum but not limited to the same for closing of the contract.

Payment against Contractor's Final Bill shall be released upon the satisfactory completion of activities pertaining to closing of the Contract.



## 2. REQUIREMENT OF CONTRACT CLOSING

The Contractor shall be required to submit the following documents but not limited to the same on Completion of work along with the final bill.

- i. Certificate of successful completion of Commissioning
- ii. Certification of submission of certified As-built documents
- iii. Reconciliation of Free Issue Material, if any.
- iv. Site clearing as per Contract
- v. Handing over of spaces and surplus materials after reconciliation, codification & acceptance
- vi. Supply and acceptance of special tools and tackles
- vii. Submission of Operating / Maintenance manuals
- viii. Submission of Final Technical Documents As-built for all supply items in bound volumes and soft copies
- ix. Submission of any balance documents to PMC / MRPL for claiming Tax benefits, as applicable
- x. Requisite approvals for Statutory Authorities and Government bodies
- xi. No dues certificate from Statutory Authorities and Government bodies
- xii. Settlement of all extra claims with PMC / MRPL, if any.
- xiii. No claims certificate
- xiv. Contractor Demobilization checklist as per Annexure I of this document
- xv. Completion of Contract Closeout checklist as per clause 2.1
- xvi. Detailed contract closeout report
- xvii. Any other documents to be submitted as specified elsewhere in the contract
- xviii. No liability certificate: Self – certification from Contractor that no payment is balance to their subcontractors and suppliers on account of service rendered / materials supplied by them or provide list of balance payments due indicating reason for non-payment / time frame for payment

### 2.1 CHECKLIST FOR CONTRACT CLOSEOUT

The broad checklist is enclosed in Annexure II. However, Contractor shall prepare his own exhaustive checklist including detailed procedure for contract closeout and get it reviewed & approved by PMC / MRPL before implementation.

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### 3. DOCUMENTATION

Documents as specified under clause no. 2.0 of this document and other documentation requirement specified elsewhere in the tender documents, are to be submitted to PMC / MRPL along with the final bill.

### 4. TIMEFRAME FOR CONTRACT CLOSURE

Contractor shall be required to submit all the documents **within Six (6) months from Mechanical Completion** to PMC / MRPL for the Contract Closing. Contractor shall take care of the following while preparing the schedule.

- Documents related to statutory authorities (like IBR, CCOE, etc.) approvals and QC documents shall be submitted at least one month before Mechanical Completion.
- Other documents for such activities, which are completed before Mechanical Completion shall be submitted within Six (6) Months from Mechanical Completion.



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**ANNEXURE I  
CONTRACTOR DEMOBILIZATION CHECKLIST**

DATE: \_\_\_\_\_

PROJECT :  
OWNER / MRPL :  
NAME OF CONTRACTOR :  
PMC :  
CONTRACT NO. :

ACTIVITY DESCRIPTION	SIGNATURE WITH COMPLETION DATE		
	CONTRACTOR	PMC	MRPL
Free issue Material reconciliation, if any			
Removal of temporary facilities viz. site office, etc.			
Clearance of site viz. debris construction material, tools & tackles, equipment, etc.			
Reconciliation of entry passes for men / materials			

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**ANNEXURE II  
CHECKLIST FOR CONTRACT CLOSING**

DATE: \_\_\_\_\_

PROJECT :  
 OWNER :  
 NAME OF CONTRACTOR :  
 PMC :  
 CONTRACT NO. :

ACTIVITY DESCRIPTION	SIGNATURE WITH COMPLETION DATE		
	CONTRACTOR	PMC	MRPL
Final Completion Certificate issued			
All deficiencies corrected			
All types of special tools & tackles delivered			
Handing over of spares & surplus materials completed			
As Built drawings including Drawing Index received			
Operation & Maintenance Manuals received			
QC documents submission completed			
Submission of Statutory / Govt. Bodies approval completed			
Final Documents submission completed			
No outstanding claims			
Back charges / recoveries Accepted			
Validity of Performance BGs checked and found acceptable			
All safety incidents resolved			
Demobilization checklist approved			



	<b>Tender for Construction works within MRPL Refinery at Mangalore, Karnataka Marketing Infrastructure Projects, MRPL</b>				
	<b>Part – A</b>	COST CONTROL	Tender No :		3200000590
	<b>Section – A-4</b>		Document No:		20005-GEN-G-DOC-9107
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<b>A-4</b>	<b>COST CONTROL</b>
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**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**

**PMC : NAUVATA ENGINEERING PVT LTD**

**JOB NO. : JBG20005**



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	Part – A	COST CONTROL	Tender No :		3200000590
	Section – A		Document No:		20005-GEN-G-DOC-9107
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## 1. INFORMATION REQUIRED WITH BID

Contractors are required to submit along with their technical bids the quantum of work separately for the package in detailed formats of the same are enclosed elsewhere in the tender. The information being sought is specifically for the purpose of assessment of understanding the bidders with respect to defined scope.

## 2. BILLING SCHEDULE

Contractor shall furnish the Billing schedule in line with the Schedule of Price (SOP) within one month of award of Contract to PMC / MRPL for Approval.

## 3. MASTER CASHFLOW SCHEDULE

Contractor shall submit a quarter-wise Master cash flow schedule based on billing schedule for entire duration of contract within a month of Placement of LOI / NOA. The cash flow schedule / projections from zero date shall be made on the basis of Billing Schedule. Thereafter, breakup of quarter-wise projection for each cost head as per billing schedule shall be furnished on quarterly basis with details of monthly projections for current plus next month.

## 4. CHANGE ORDER / DEVIATION PERMIT

For Change Order / Deviation Permit, Contractor shall prepare and submit necessary supporting documents containing reason for change / deviation, estimated cost along with rate analysis and quotation / documentary support, sketches and drawings and impact on schedule to PMC / MRPL.

Contractor shall maintain Change Order / Deviation Permit registers that will list all the change orders / deviation permits and indicate their approval, cancellation or rejection status.

Methodology for change order & deviation permit to be raised for consideration of PMC / MRPL and shall be finalised after award of contract.

All the deviation permits are required to be submitted by the contractor through Contractor's Online Document Management System.

## 5. PROJECT COST CONTROL AND MONITORING



Contractor shall include a chapter on Cost Control in the Monthly Progress report which shall have the following sections.

### 5.1 COST STATUS SUMMARY

Cost Status of the Contract shall be furnished with a breakup of costs under the heads of the original contract value and Estimated / Actual value, approved change orders, pending change orders, approved deviation permits, invoice to-date and payment to-date.

### 5.2 CHANGE ORDER / DEVIATION PERMIT

The status of all change orders / deviation permits.

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### 5.3 CASH FLOW STATUS

Quarter- wise cash flow with monthly breakup for current + 2 months status in the monthly report with following details.

- Actual / Likely invoiced
- Actual / Likely received
- Actual / Likely net cash flow

### 5.4 EXTRA ITEMS

Contractor shall furnish the status of extra items. Bunching on such issues are not allowed. Contractor if failed to submit the details of extra items within a month of identification, no claim on the same will be entertained in subsequently.

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## CONDITIONS FOR ISSUE AND RECONCILIATION OF MATERIALS



### 1.0 CONDITIONS FOR ISSUE OF MATERIALS

Whenever any material is issued by Owner, following conditions for issue of material in addition to other conditions specified in the contract shall be applicable:

- 1.1 Necessary indents shall be raised by the Contractor as per procedure laid down by the Engineer-in-Charge from time to time, when the materials are required for incorporation in permanent works.
- 1.2 Materials shall be issued only for permanent works and not for temporary works, enabling works etc. unless specifically approved by the Engineer-in-Charge.
- 1.3 The Contractor shall bear all other cost including lifting, carting from issue points to work site/Contractor's store, custody and handling etc. and return of surplus/serviceable scrap materials to Owner's storage points to be designated by the Engineer-in-Charge. No separate payment for such expenditure shall be made.
- 1.4 No material shall be allowed to be taken outside the plant without a gate pass.
- 1.5 The Contractor shall be responsible for proper storage, preservation and watch & ward of the materials.

### 2.0 RETURN OF UNUSED MATERIAL/ SCRAP

- 2.1 2.1 All unused/scrap materials shall be the property of the Owner and shall be returned in good and acceptable condition category wise by the Contractor at his own cost to Owner's Store(s).
- 2.2 No credit shall be given to the Contractor for return of scrap. The Contractor should quote the rates accordingly. Contractor shall make his own arrangements for weighing the cut offs to be returned to Owner's stores.
- 2.3 In case the Contractor fails to return unused materials/ accountable scrap, then recovery for such quantity of materials, not returned by the Contractor shall be affected at following penal rates from the Contractor's bills or from any other dues of the Contractor to the Owner:

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S. No.	Material		Penal Rates
1.	(a)	Penal rate for non return of accountable scrap	Issue Rate + 25% or Landed Rate + 25% (in case issue rate are not indicated in the contract)
	(b)	Penal rate for return of serviceable materials	
	(c)	Penal rate for issuance of unplanned OFC jointing kits	
2.	(a)	Penal rates for non return of Unused material or penal rate for generating scrap in excess permitted % allowances	Twice the Issue Rates or Twice the Landed (in case Issue Rates are not indicated in the Contract)
	(b)	Penal rate for using excess amount of materials like cement than permitted %	

NOTE: 1) Landed Rate shall be arrived from the latest Purchase Order of respective material received at site by Owner/EIL.

2) In case more stringent penal rates have been indicated elsewhere in the Contract (based on Project requirement), the same shall supersede the above rates.



### 3.0 CEMENT

3.1 Cement as received from cement Manufacturer/Stockists shall be issued to the Contractor. The theoretical weight of cement in each bag for issue purpose shall be considered as 50 Kg or 20 bags per MT. However, cement bags weighing upto 4% less shall be accepted by the Contractors and charged for as full bag.

3.2 The Contractor is required to submit the design mix for different grades of concrete, keeping in view the requirements stipulated in IS:456 and IS 10262, specifically regarding durability, slump and water cement ratio and specific gravity of materials brought to site as analyzed in the laboratories. The design shall be based upon absolute volume method and theoretical consumption of cement shall be worked out on this basis. For other than concrete items, the coefficients for consumption of cement shall be adopted as per CPWD practice.

3.3 The permissible variation between Cement actually used on the job and theoretical consumption worked out on the basis stipulated in above para 3.2 and as determined by Engineer-in-Charge shall be 3% (Three percent only).

If the actual consumption is more than 103% of the theoretical consumption, then recovery at

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the penal rates for the quantity of cement beyond the limit of 103% of theoretical consumption shall be affected as per clause 2.3 above.

**3.4** Unused quantity of cement shall be returned by the Contractor to the Owner's stores **in** good condition only.

**3.5** The Contractor shall maintain a good store for storing cement issued to him. The flooring of the storage house, the clearances of cement bags from the side walls/ floor & stack height etc. shall be as instructed by the Engineer-in-Charge.

**3.6** The contractor shall maintain a Cement Register **in** prescribed format and update the entries on daily basis.

**3.7** The cement store shall be offered for inspection and verification by the Engineer-in-Charge or his authorized representative at any time when the Engineer-in-Charge feels the need to do so.

**3.8** Empty cement bags shall be the property of the Contractor and shall have to be disposed off by him.

#### **4.0 REINFORCEMENT BARS/ STRUCTURAL STEEL / PLATES**

**4.1** The scrap allowance for the reinforcement bars/structural steel including steel plate issued by the Owner, shall be total 3% (2.5% accountable and 0.5% unaccountable) of the actual consumption as incorporated **in** the works.

**4.2** All serviceable reinforcement bars/structural steel/steel plates shall be issued **in** available length/shapes/sizes and no claims for extra payment on account of issue of non-standard lengths/shapes/sizes and bending etc. shall be entertained. Reinforcement bars and structural steel shall be issued on weight basis as per normal warehousing practice. **In** exceptional circumstances, the reinforcement bars/ structural steel, if issued on linear measurement, the IS coefficients for unit weight shall be considered. For the purpose of billing and accounting, only linear measurements shall be taken and weight shall be calculated as per IS coefficients **in** three decimals. The difference in unit weight as per IS and actual as issued, if any, shall be



to Contractor's account and Contractor is deemed to have considered the same at the time of bidding.

**4.3** Reinforcement bars/structural steel/steel plates shall be issued only for those items where Owner's supply has been specifically mentioned in Schedule of Rates/ Scope of Supply. The storage of these items shall be done in such a way so as to avoid rusting/ damage to any kind to the materials.

**4.4** All reinforcement bars/structural steel (except M.S. Plates) in length of 2 meters and above shall be considered as serviceable materials provided the material is in good and acceptable condition. Reinforcement bars/structural steel section (except M.S. Plates) in lengths less than 2M shall be treated as scrap.

The contractor shall strive to avoid generation of cut pieces of length 2m and above, as far as practicable, by effectively planning & executing the construction works.

**4.5** For the purpose of accounting of the plates, all plates measuring not less than 1 Sq.m in area and having any dimensions not less than 200mm when returned to Owner's store, shall be

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considered as serviceable material. All other pieces shall be treated as wastage/scrap. The Contractor shall prepare a plate cutting diagram in such a way that the minimum scrap 1s generated. Also the cut plates should be used at proper places to reduce the scrap.

**4.3** The serviceable cut pieces as mentioned in 4.4 & 4.5 above shall be considered as unused material for reconciliation purpose.

**4.4** Material appropriation shall be done and wherever applicable, the recovery at penal rates as per clause 2.3 above shall be affected from the contractor.

## **5.0 PIPING MATERIALS**

**5.1** All serviceable pipes shall be issued in available lengths/shapes and no claims for extra payments on account of issue of non-standard length & shape shall be entertained. Pipes shall be issued on linear measurement basis. All valves, flanges, fittings etc. shall be issued on number(s) basis. Contractor shall store the materials in such a way so as to avoid mixing of different types of material and shall maintain complete identification and traceability at all times.

**5.2** The scrap allowance for pipes issued by the Owner shall be 3% (2.5% accountable + 0.5% unaccountable) of the actual consumption as incorporated in the works.

**5.3** All pipes in length of 2 meters and above shall be considered as serviceable material provided the material is in good and acceptable condition and has clear identification and traceability (Manufacturer's name, heat number/batch number and test certificates). Pipes in lengths less than 2M shall be treated as scrap.

**The contractor shall strive to avoid generation of cut pieces of length 2m and above, as far as practicable, by effectively planning & executing the construction works.**

**5.4** All unused/scrap pipes, valves, flanges, forged fittings like elbows, reducers tees shall be returned by the Contractor category wise duly cleaned, greased and spec. marked at his own cost to Owner's stores.



**5.5** Material appropriation shall be done and wherever applicable, the recovery at penal rates as per clause 2.3 above shall be affected from the contractor.

## **6.0 EQUIPMENTS**

Various equipment/materials intended for the installation shall be received by Owner in unpacked, skid mounted, crated, packed or loose condition and shall be stored in the warehouses and open yards. In general, materials shall be issued to the Contractor in 'as received' condition. It shall be the Contractor's responsibility to draw, load and transport all materials from Owner's designated places of issue to the point of installation and return all packing materials like steel frames, wooden boxes/scrap etc. to Owner's stores.

All materials supplied by the Owner shall be duly protected by the Contractor at his own cost with appropriate preservative like primer, lacquer coating, grease etc. as required.



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## 7.0 CABLES

Appropriation of cables shall be done as follows:

- 7.1** All the surplus and serviceable cables out of the cables quantity(ies) issued by the Owner to the Contractor shall be returned by the Contractor to the Owner's store in good condition and as directed by the Engineer-in-Charge.
- 7.2** The Contractor shall be allowed a cutting/wastage allowance (accountable scrap) of 1.5% for power cables and 3% for the control cables. This cutting/wastage allowance shall be computed on the length of cables actually laid, measured and accepted.
- 7.3** All cables being returned to store should carry Aluminium sheet tags indicating the size & type of cable. Cables of less than 15 meters length shall be termed as scrap. Cables of lengths 15M and above shall be termed as serviceable material & shall be returned size wise and category wise to the Owner's store in wooden drums. Cables of serviceable length being returned to stores in drum(s) shall be accepted only after Megger value continuity test and physical measurement is carried out by the Contractor to the satisfaction of Engineer-in-Charge. Empty cable drums and major packing material (as decided by Engineer-in-charge) shall be Owner's property and shall be returned to Owner's Store/designated place without any additional cost.

The contractor shall strive to avoid generation of cut pieces of length 1 Sm and above, as far as practicable, by effectively planning & executing the construction works.



- 7.4** While carrying out material appropriation with the Contractor, the above points shall be taken into account. All serviceable materials returned by the Contractor (size wise & category wise) shall be deducted from the quantity(ies) issued to the Contractor for the respective sizes. Scrap generated for power cable and control cable shall also be returned to Owner's store on Lot basis. Wherever applicable, the recovery at penal rates as per clause 2.3 above shall be affected from the contractor.

## 8.0 LINE PIPES

- 8.1** All bare/ coated line pipes as per Line Pipe specifications shall be issued on linear measurement basis. The serviceable line pipes shall be issued in available lengths and shapes and no claim for extra payment on account of issue of non-standard length and shape shall be entertained. Contractor shall store and maintain the line pipes in proper manner to avoid mixing of different classes of pipes. Contractor shall maintain complete identification and traceability at all times. All cut pieces when returned to Owner's storage points after beveling, shall be considered as serviceable material provided:

- a) Corrosion Protection Coating is intact.
- a) Pipe pieces have pipe specifications, manufacturer's logo/name and heat number duly authenticated with hard stamp of the authorized inspector as per approved procedure.

All cut pieces of pipes measuring less than 2 M shall be treated as wastage/scrap.

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The contractor shall strive to avoid generation of cut pieces of length 2m and above, as far as practicable, by effectively planning & executing the construction works.

**8.2** For the purpose of accounting of bare/ coated line pipes, following allowances shall be permitted:

a)	Unaccountable wastage	
	upto 100 Km	0.1%
	101 to 500 Km	0.07%
	beyond 500 Km	0.05%
b)	Scrap (All cut pieces of pipes measuring less than 2 Meter)	0.25%
c)	Serviceable materials (All cut pieces of pipe measuring 2 Meter and above)	0.5%

The percentage allowance shall be accounted on the basis of pipe book chainage for main pipeline.



**8.3** Material appropriation shall be done and wherever applicable, the recovery at penal rates as per clause 2.3 above shall be affected from the contractor.

## **9.0 OPTICAL FIBRE CABLE**

**9.1** For the purpose of accounting of optical fibre cable, all cut pieces measuring in length of 40 m and above when returned to Owner's storage points shall be treated as serviceable materials. All cut pieces of cable measuring less than 40 M shall be treated as scrap.

For the purpose of accounting of OFC (Optical Fibre Cable) following allowances shall be permitted:



a)	Unaccountable wastage	0.5%
b)	Scrap (All cut pieces of cables measuring less than 40 M)	0.25%
c)	Serviceable material (measuring 40m to 750m)	0.25%

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The percentage allowance shall be accounted on the basis of pipe book chainage for main pipeline.

Cables returned in original drum (measuring 750m and above) with Optical Time Domain Report (OTDR) shall be considered as unused material.

- 9.2** The contractor shall strive to avoid generation of cut pieces of length 40m and above, as far as practicable, by effectively planning & executing the construction works.
- 9.3** Material appropriation shall be done and wherever applicable, the recovery at penal rates as per clause 2.3 above shall be affected from the contractor.

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**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**

**PMC : NAUVATA ENGINEERING PVT LTD**

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## 1. INTRODUCTION

Mangalore Refinery & Petrochemicals Ltd (MRPL) operates a 15 MMTPA crude processing refinery with secondary units and Petrochemical complex at Mangalore. MRPL proposes for tank conversion and associated construction works at MRPL refinery site.

The proposed modification would cater to requirements of transferring petroleum products from Mangalore to Marketing terminal at Devangonhi.

## 2. GENERAL

This chapter details out various drawings and documents to be generated at various stages during the course of execution of the project by the Contractor for different project activities. An endeavor has been made to distinctly categorize each document and the purpose for which they are required by either agency.

The Contractor recognizes that efficient handling of drawings and documents to be prepared by him under the contract is the key to the timely completion of the plant. The Contractor undertakes to ensure that all drawings and documents to be submitted by him to the PMC and / or owner shall be of professional quality and conforming to the contractual requirements. Contractor also undertakes to institute a formal drawing / document control system which will be documented and submitted to the Owner / PMC for review or approval.



Compliance of this chapter on drawings and documents is mandatory and is non-negotiable.

The drawings / documents are generated by Contractor at various stages of the project covering different activities. The drawings / documents generated will be in the category of Approval / Review / Information. The drawings and documents required under different categories is enclosed. However, this will in no way relieve Contractor of responsibility to conform to drawings, standards, specification, codes and contractual requirements.

Computer aided design and drafting shall only be used. Standard approved and well established P.C. based computer programs / software packages, available in market shall only be used by the Contractor / his Sub-Contractors / vendors etc. In home developed packages shall not be used. Contractor shall bring out the list of all such packages in the offer for each discipline for evaluation of bid. Every time a computer aided design is submitted for review / approval to Owner / PMC, It shall accompany with input / output data on CD's along with the name of the software package and operable on any IBM compatible PC system along with the requisite no. of hard copies (specified elsewhere in the Bidding Document).

In case this condition is not fulfilled, the Contractor shall have to supplement / replace the computer aided design with long hand calculation to the satisfaction of Owner / PMC with any time and cost implications solely to Contractor's account.

All documents before forwarding to Owner / PMC will have to be wetted in detail by Contractor / duly approved engineering Sub-Contractor appointed by the Contractor. Document received without wetting will be returned. Also any inaccuracies / mistakes found will not only be rectified by the Contractor but the contractor shall also remain liable for bearing charges towards efforts spent by Owner / PMC for discussing the same. Delay owing to these shall be to the account of Contractor.

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Approval / review of the drawings / documents by Owner / PMC would be only limited to the review of computability with basic designs and concepts. The approval / review by the Owner / PMC shall not be construed by the Contractor as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and drawings.

Contractor shall furnish 3D modeling of plant & piping with dynamic walk-through facility to check any interference, requirement of safety, operation and maintenance for getting approval from Owner / PMC atleast 6 months before completion & after incorporation of vendor data and Code-1 drawings. Details of 3D Modeling shall be as per the requirement specified in scope of work for piping.

Such modeling shall be done by an agency who have proven track record for 3D modeling of process unit with similar complexity.



Each drawing submitted by the Contractor shall be clearly marked with the name of the Owner & PMC, the unit designation, the specifications, title, the specification number and the name of the Project with revision No. and data if standards catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawings shall be in English.

All the dimensions should be in metric units. Upon receiving comments on Drawings / Documents by the Contractor, the subsequent submission should give compliance report, separately on each of the comments, document-wise. Comments given by Owner / PMC shall be discussed, if required, and finalized within the agreed schedule.

The schedule of submission of Drawings / Documents shall be in accordance with project plans only. The detailed list under different category document-wise, shall be prepared by Contractor for approval / review of Owner / PMC. This activity is to be to Contractor's account and shall be submitted during kick- off meeting.

Sequence of submission of drawings is essential for proper review of documents and timely completion of the project and is to be strictly adhered to. In case sequence is not maintained, the documents submitted will not be reviewed by Owner / PMC and responsibility of timely execution of plant / unit shall be to Contractor's account.

The Contractor shall maintain up-to-date record of drawings and document status and make regular issue of drawings / documents index discipline wise, on fortnightly / monthly basis as agreed with copies to PMC Site, H.O and Owner, indicating schedule date of submission, submission data of various revisions and data of review with code.

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### 3. REVIEW OF CONTRACTOR'S DOCUMENTS BY OWNER / PMC

#### 3.1. OWNER / PMC REVIEW

3.1.1. For the purpose of review in respect of Contractor's engineering and other documentation, the documents are classified into 3 categories.

- Class 1. APPROVAL category
- Class 2. REVIEW Category
- Class 3. RECORDS Category

Class 1. Approval by PMC is required before proceeding with the work. PMC to intimate the EPCC Contractor in case of any anticipated delays in issuing the approvals.

Class 2. Contractor can proceed, if Owner / PMC comments are not received within 10 working days of the date of Owner / PMC receipt of document. However if major deviations to contract specifications or any design deficiency is detected in the course of review after the stipulated period, it shall be the responsibility of the Contractor to see that such deviations and deficiencies are corrected to ensure compliance to contract specifications. In case Contractor's personnel are not available at PMC office, approval / review time shall be 15 days. However, Owner / PMC reserves the right to comment within 45 days of receipt of drawings and it is Contractor's responsibility to correct deviations if any without cost and time implication.

Class 3. Contractor shall submit documents for Owner / PMC's information and proceed with the work. Owner / PMC comments if any which relate to inadequacy or inaccuracy may be brought to the attention of Contractor at any stage for incorporation without any cost or time impact to Owner.



3.1.2. For the purpose of indicating the status of Review / Approval of a document, following status codes shall be followed.

Code 1 means No comments, work may proceed

Code 2 means The Contractor shall proceed with the fabrication / manufacturing taking care of and incorporating Owner / PMC comments. Contractor shall submit the Drawings again duly revised incorporating Owner / PMC comments.

Code 3 means Major non-conformance and deviations to contract specifications and the document is rejected. Contractor is to resubmit for review after incorporating comments In case the drawings / documents are under Code-3, the time spent by PMC shall be back charged to EPCC Contractor.



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The documents / drawings submitted by the Contractor shall be accorded the status code as above by Owner / PMC depending upon the nature of comments on review

3.1.3. Owner / PMC failure to comment or to only partially comment upon any class 1 documents shall not be construed as an acceptance of the content of the documents unless the Owner / PMC advises otherwise.

3.1.4. Detailed Document list (discipline wise) is furnished herewith identifying the Class of review to be performed on various drawings / documents. Contractor shall submit 8 sets each of the drawings / documents identified in the list. In case of Documents pertaining to multi-disciplinary review. 10 sets shall be submitted.

### 3.2. CONTRACTOR'S REVIEW

3.2.1. The following cycle time shall be adopted by the Contractor for the incorporation of comments and resubmission of documents.

Review of Owner / PMC comments by Contractor	5 working days
Owner / PMC and Contractor discussion on Comments if required	5 working days
Incorporation of comments in drawings and resubmission	5 working days



3.2.2. Contractor shall revert on unacceptable comment, if any, with adequate justification within 5 working days. In the absence of any rebuttal by Contractor, all comments will be deemed as acceptable to the Contractor.

### 3.3. INSTRUCTION TO CONTRACTOR



3.3.1. Review / approval of Drawings / Documents by Owner / PMC shall not absolve the Contractor of their responsibilities to ensure defect free design and strict compliance to contract specifications. All documents shall be released for review having first fully checked and approved by the Contractor. Any changes shall be clearly highlighted. Incomplete, unchecked and unsigned documents / drawings and designs shall not be accepted for review/construction and shall be returned forthwith. Time delay on account of such submissions shall be to Contractor's account.

3.3.2. At the kick-off meeting, the Contractor must submit discipline wise list of documents and drawings schedule.



3.3.3. The drawings schedule (discipline wise) shall include description of drawings / documents, category of drawings, scheduled date of submission, actual date of submission, review code received with these dates.

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- 3.3.4. The Contractor shall separately submit list of drawings / documents involving multi-disciplinary reviews at the kick off meeting itself. Extra copies shall be furnished for simultaneous distribution to all concerned.
- 3.3.5. Critical and typical drawings / documents having impact on schedule and quality should only be identified for such timely reviews. This shall be adopted after receipt of drawings / documents indices from the Contractor at the kick-off meeting with mutual understanding of the Contractor / concerned specialist / Owner
- 3.3.6. After the placement of purchase order the Contractor shall prepare a schedule of vendor's document with details as mentioned in Clause 3.3.3.
- 3.3.7. All requirements specified in the Bid Package / Contract is with the intent of providing a safe, user friendly FACILITIES conforming to all applicable codes, standards, regulations etc. The drawings prepared by the Contractor shall reflect these requirements.
- 3.3.8. Each drawing submitted by the Contractor shall be clearly marked with the name of the Owner, the unit designation, the Document/Drawing, title, the Document/Drawing number and the name of the Project with revision No. and date. If standard catalogue pages are submitted the applicable items shall be indicated therein. All titles, markings and writings on the drawings shall be in English.
- 3.3.9. All the dimensions should be in metric units. Upon receiving comments on Drawings and Documents, the Contractor during subsequent submission should give compliance report, separately on each of the comments, documents-wise. Comments given by Owner / PMC to be discussed if required and finalized within agreed schedule.
- 3.3.10. The schedule of submission of the Drawings & Documents shall be in accordance with agreed project plans only. The detailed document list under different category, document-wise shall be prepared by Contractor for approval of Owner. This activity is to be completed within one month of award of contract.
- 3.3.11. Sequence of submission of drawings is essential for proper review of documents and timely completion of the project and the same is to be adhered to. In case sequence is not maintained, the documents submitted will not be reviewed by Owner / PMC and the responsibility of delay in REVIEW/Approval shall remain to Contractor's accounts.
- 3.3.12. Contractor shall maintain up-to-date record of drawings & document status and make regular issue of drawings / documents schedule indicating schedule date of submission, submission date of various revisions and date of review with code (Refer Annexure-I)

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- 3.3.13. Contractor shall plan submission progressively so that no bunching takes place and ensure that all documents provided by sub-contractors/vendors meet the timing requirements of the schedule and are not released in major batch issues. Contractor shall expedite such information to ensure that the sub-contractor/vendor commitments with respect to schedule are maintained.
- 3.3.14. Review period shall be reckoned from the “Date of Receipt” of documents/drawings by Owner / PMC at the Jacobs, review center to the “Date of Dispatch” from the review center. Contractor shall monitor submission and receipt. Drawings / documents received in the afternoon prior to holiday/week end shall be accounted as received on the following working day, for the purpose of review period.
- 3.3.15. Sequence of submission of drawings is essential for proper review of documents and timely completion of the project and the same is to be adhered to. In case sequence is not maintained, the documents submitted shall not be approved / reviewed by Owner / PMC and the responsibility of timely execution of the plant shall remain to Contractor’s accounts.
- 3.3.16. The critical documents falling under Approval category will in general be returned with comments within 10 working days, except the documents which involves multi-disciplinary review. For documents like control room layout, equipment layout, single line diagram compressor house layout, P&ID of compressors, etc the Contractor shall arrange for joint meeting with Owner / PMC for review of documents across the table. The Contractor shall submit CD’s for transfer of “Transmittal Sheets”, receiving date shall be considered as date entered in the transmittal by PMC. The records category document will be retained for information only. However Owner / PMC reserves the right to comment at any stage of the project and it is Contractor’s responsibility to correct the deviation if any to the stipulation in the bid document without any cost and time impact to Owner.
- 3.3.17. Where Approval of Owner / PMC is required for ordering critical equipments /materials, recommended technically selected offer, Technical Bid Analysis and Purchase Requisition / Specifications shall be submitted for review before ordering.

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- 3.3.18. Each purchase order/Requisition forwarded should contain complete technical document. It is obligatory for the Contractor to obtain acceptance on all technical requirements and accepted copy of the same only to be forwarded to Owner / PMC. Any inaccuracies / omissions / inconsistencies noticed and brought to the notice of the Contractor at any stage of the project will be rectified/replaced by Contractor at no additional cost to the Owner.
- 3.3.19. Revision / updation of process P&ID's shall be done on the P&ID's issued to the Contractor as a part of CONTRACT documents. Contractor shall not redraw the P&ID's. Electronic file of process P&ID's will be provided by Owner / PMC.
- 3.3.20. Documents required to be submitted by Contractor to Statutory Regulation Authorities indicated in PREAMBLE shall have to be furnished beforehand to Owner / PMC
- 3.3.21. Quality of drawings / documents are essential for a timely review. If major comments / deviations to the agreed design basis and Bid Specifications are noticed, the drawings shall be rejected in Code-3. Review period required for subsequent submissions in case of Code-3 drawings shall be to the accounts of the Contractor.
- 3.3.22. Piping/Instrument & other engineering drawings/documents shall be issued only after the corresponding P&ID's & Process documents coming under review category/residual process engineering category are first reviewed. P&ID's shall be accompanied with Interlock write-up and/or Process cause and effect diagram.
- 3.3.23. In principle Contractor is not expected to revise drawings/documents already reviewed in Code-1.
- a) If it is utmost necessary to revise or add some minor details in Code 1 drawings, Contractor shall highlight such revisions by marking "CLOUD" to such additions/alterations, Contractor is also needed to provide a "BLOCK" in the drawing indicating reasons of such changes and to insert another "Review Block". Owner / PMC shall put relevant code for such revisions only. Code marking given by Owner / PMC on such revisions shall not change the category of drawings.
- b) Any major change in Code 1 drawing shall call for preparation of new drawing.
- 3.3.24. Once a document is already reviewed in Code-2, subsequent submission due to non-incorporation of comments shall not be accounted for any contractual commitment on time schedule from Owner / PMC. Contractor shall comply with Owner / PMC comments in the next revision after Code-2.
- 3.3.25. Based on the confidence gained on Contractor's quality of drawings / documents already submitted. "Approval / Review Category" drawings could be retained as information / Records and vice versa at the discretion of Owner / PMC. This however, does not change the category of drawings.

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3.3.26. EPCC main Contractor shall open an engineering office in Bangalore for review of the following drawings & documents:

- Long delivery items
- Schedule critical drawings and documents.

However for review of multi-disciplinary drawings and documents, the engineering Contractor shall furnish at PMC Review Center.

3.3.27. Any drawing/document submitted for seeking deviation shall be separately identified and shall not be considered as a document for timely review.

3.3.28. When Owner / PMC deploy engineers at the Contractor's work center following shall be satisfied.

Review limited to identified long delivery/schedule critical review only.



Readiness of documents/drawings shall be ensured by the Contractor

Presence of all discipline engineers of Contractor at the engineering sub-contractor's office when Owner / PMC engineers visit the sub-contractor's review center.

3.3.29. If Owner / PMC highlights any necessary rectification's required in the construction at the time of Technical Review/Audit, or construction executed based on information category drawings but not complying with Bid requirement, Contractor shall rectify the same without any cost or time impact to Owner.

3.3.30. Contractor shall submit designs and drawing for review, only after the corresponding GA/Eqpt. Data sheets etc have been coordinated in his office and reviewed/approved.

3.3.31. Only HTRI latest software's to be used for thermal design of shell and tube heat exchangers and air- cooled exchangers. Design output shall be made available on CDs in HTRI versions.

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### 3.4. REVIEW OF BID EVALUATION REPORT

- 3.4.1. Contractor shall ensure that all equipment in this EPCC package are ordered on vendors who are capable of supplying equipment, meeting all requirements of the Project Specifications.
- 3.4.2. Contractor shall submit a comprehensive bid evaluation report and recommendation for procurement of major equipment to Owner / PMC prior to award of purchase order. The report shall incorporate, but is not limited to;
- Names and addresses of the companies invited to quote or bid.
  - Recommended supplier
  - Evaluation of Vendor quality system
  - Scheduled award date
  - Quoted delivery date
  - Reason(s) for rejecting unsuccessful bidders whether it is technical, commercial, delivery etc. Reason for recommendation.

### 3.5. REVIEW OF PURCHASE REQUISITION



Contractor shall forward for all equipment, Purchase Requisition together with attached documentation, to Owner / PMC. Besides the Purchase Requisition to be approved for items covered in clause 4.4.3 above, additional items required for review, prior to award of the Purchase Order as identified in respective tables of Part III, shall be finalized during the kick off meeting. Such review by Owner / PMC shall not relieve Contractor of any of his obligations under the Contract. Orders shall be placed for equipment, only after the approval of the Purchase Requisition by Owner / PMC. All subsequent changes to Purchase requisition following review of the original, shall be subject to prior Approval. Where requisitions specify a particular make or brand of equipment to be used followed by the statement “or Purchaser approved equal”, any such “equal” proposed by the suppliers shall be submitted for Approval of Owner / PMC.

### 3.6. APPROVED FOR CONSTRUCTION DRAWINGS

Drawings approved / reviewed under Code 2 & Code 1, required for the execution at site shall be arranged by Contractor to PMC (RCM), Contractor’s RCM and MRPL (Site).

- “Approved for Construction” stamp / sticker separately on the reviewed print and not on the Title Block.
- Without changing Revision Number, Contractor to arrange adequate number of prints of documents and drawing to Contractor’s RCM, 2 copies of PMC RCM and one copy to MRPL (Site) with transmittal.



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- 3.7. - Copy of such transmittal shall be sent to PMC (HO) & MRPL (HO) for records.  
ACTIVITY SEQUENCE FOR DRAWING APPROVAL (THROUGH E-MAIL)

Contractor shall establish an electronic mail system compatible with that of Owner / PMC for document / data transfer. For details refer Part I Section 5.

The drawings requiring Owner's / PMC's approval / review shall be transmitted to office of Owner / PMC by e-mail.

Contractor shall establish a local office having facility of telephone, fax and electronic mail system for receiving documents and drawings from outstation.

On receiving the drawings / documents at Bangalore through e-mail, Contractor shall send the same to Owner / PMC through e-mail facility. However, three sets of hard copies each for general and four sets of hard copies each requiring multi-disciplinary review shall be sent by Contractor to Owner / PMC separately by courier or by hand delivery.



A hard copy duly signed with comments / approval shall also be sent back to Contractor by courier / by hand delivery.

It shall be responsibility of Contractor's representative at Bangalore to transmit the drawings / documents to their design office / vendor works.

Contractor shall also establish electronic system at site to receive all drawings and documents with all printing and scanning facilities.

The approved / reviewed drawings shall be transmitted to site by Contractor.

Necessary printing / plotting and distribution of documents and drawings to RCM (Contractor), RCM (PMC) and MRPL Site is the responsibility of Contractor.

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#### 4. Documents / Drawings for Approval, Review by Owner / PMC

##### 4.1. DOCUMENTS FOR APPROVAL / REVIEW

The documents listed below required to be submitted to OWNER / CONSULTANT directly or arranged from Cost plus contractor which is applicable for the purpose of either approval or review/comments as mentioned against each item.

DOCUMENT DESCRIPTION	NO. OF COPIES TO BE FURNISHED FOR		Remarks
	APPROVAL	REVIEW/ COMMENTS	
	H.O + SITE		
<b>A. Process Documents</b>			
P&ID, Revision/ updation in line with Tender P & ID	6		
Pre-commissioning & Flushing Plan	6		
Operation Manual	6		
HAZOP Study Reports	6		
SIL Review Report	6		
Hook-ups Drawings	6		
<b>B. Engineering Documents</b>			
Unit Plot Plan	3	3-	
Electrical single line Diagram	3	3-	
Area Classification	-	3	
Basic schematics of process controls & interlocks including auto trips/ alarms	3	3	
<ul style="list-style-type: none"> <li>- Ladder Logic &amp; write up</li> <li>- Instrument point database</li> <li>- JB schedule &amp; cable schedule</li> <li>- Vendor prints/manuals</li> <li>- Instrument datasheets</li> <li>- Vendor list</li> </ul>		3 each	
Control Panel Layout	3	-	
Effluent collection and Disposal scheme (if applicable)	-	3	
Critical Purchase documents	3	3	



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<b>C. Estimating &amp; Cost Control (Purchase &amp; works contracts)</b>			
NIT estimates	2	2	
Tender estimates incl. Rate Analysis or basis of rates	2	2	
<b>D. Tenders/Purchase</b>			
PQ documents	3	-	
BID documents / recommendations	2	-	
Letter of Acceptance	3		
Draft Addendum, if any	2	-	
<b>E. Planning &amp; Scheduling</b>			
Master Network	3	-	
Tender Schedule	3	-	
Construction Schedule	3	-	



**Notes:**

1. CONTRACTOR will furnish a data file of all the drawings. The file format of electronically prepared data file shall be decided during kick off meeting.
2. List of critical purchase documents shall be decided within 12 weeks after award of contract

**4.2. DOCUMENTS FOR INFORMATION**

Following documents, as applicable, will be submitted to OWNER/CONSULTANT as and when generated, for information.

DOCUMENTS DESCRIPTION	NO OF COPIES	
	HQ	Unit / site
Daily Progress Reports (H.O. & Site)	1	1
Weekly Progress Reports (H.O. & Site)	1	1
Monthly Progress Reports (H.O. & Site)	2	2
Monthly Material Status Report (HO & Site)	1	1
Tender Schedule	1	1
Procurement Schedule	1	1
Engineering Schedule of contractors	1	1

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Construction Schedule	1	1
Milestones	1	1
Drawing Index	1	1
Relevant Correspondence and Minutes of Meetings with Vendors/Contractors	2	1
Test Records wherever applicable		1
Overall Engineering Schedule (Bar Chart/ PERT/CPM Charts)	1	1
Overall Construction Schedule (Bar Chart/ PERT/ CPM Chart	1	1



**NOTE:**

In all deliverables, approvals are to be taken from the OWNER/CONSULTANT after incorporation of comments. The tender document shall be prepared w.r.t. estimate/ specification/ quantities/ works contract for cost plus LSTK bids.

**4.3. FINAL DOCUMENTS**

Following documents (as applicable) will be submitted to OWNER/CONSULTANT as final documents (Properly bound & indexed in order & volumes):



DOCUMENTS DESCRIPTION	NO OF COPIES	
	HQ	Site / unit
P&ID (As built)	4	4
Plot Plan (approved )	Original	
Plot Plan (As built)	4	4
Final Vendor's as built drawings of fabricated equipment as supplied by Vendor		8
Piping & Isometric drawings (as build)		4
Release note issued by 3rd party Inspector for all the bought out items		3
Final copies of P&IDs, plot plan,3D model and all piping drawings, design calculation ,stress analysis report & CD (Auto CAD version no. 14 or latest)	1	3
As built Cable schedule, Interlock logic, loop schematics & loop wiring diagram, Terminal details, Instrument specification etc. in hard and soft copies(XL or Excess)	1	2
Draft LOA & tender document for CONTRACT agreement	8	

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Manufacturer's certified dimension drgs. erection, operating & Maintenance instructions and spare parts listed for machinery including rotating equipment as supplied by Vendor including		4
Test Records		1
Material Acceptance Certificate		1
Engineering drawing as built		4 prints + 1 SEPI
Updated process package of all offsites & utilities		8 each
Final Hazop study report	2	4
Plant specific operating manuals		8 (each)
Test Certificate for hydrostatic testing of equipment and piping calibration and test reports of Instruments and electrical pumps.		2
Data regarding settlement of tank foundations during hydro-Static testing		2
All NDT results viz. MP/ DP, Radiographic records, including failures record registers and line data together with inter preparation recheck and/ or Repair records.		1
Site calibration certificate (with traceability) of all the instruments.	1	2
Instrument datasheets for all the instruments in soft and hard copies	1	2
FAT & SAT reports	1	2
final Instrumentation documents	1	2
Control & Logic writeup	1	2
Hook up drawings	1	2
Alarm and trip set points for all the instruments	1	2
Draft Purchase Order	6	
Purchase/ Tender Award Recommendations	2	
Cost Status Report	3	

Note:



- 1.0 All the document requirements are indicative only and Contractor has to meet the actual requirement at no extra cost.**

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#### 4.4. Vendor Drawing Review

Each vendor Drawing / Document listed either under Approval / Review or Record category shall be reviewed by the Contractor for ensuring strict compliance to the Bid Specification requirements. The reviewed document shall be submitted along with comment sheet and shall carry the Reviewer's signature and Seal of the Contractor prior to submission for PMC's Approval / Review.

On non-compliance of above, the document shall be returned without review.

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	Part - B	<b>PACKAGE - D</b> <b>SCOPE OF WORK (BROWN FIELD)</b> <b>FOR REFINERY &amp; PMHBL</b> <b>MODIFICATION</b>	Tender No:	3200000590	
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B-1	<b>TECHNICAL REQUIREMENT</b>
B-1.1	<b>SCOPE OF WORK FOR PIPING, MECHANICAL INSTALLATION AND ASSOCIATED WORK (BROWN FIELD)</b>

**MRPL Infrastructure Project, Mangalore**



**PROJECT** : Marketing Infrastructure Projects, MRPL

**MRPL** : MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC** : NAUVATA ENGINEERING PVT.LTD.



**TENDER NO.** : 3200000590

0	29-Oct-2022	ISSUED FOR TENDER	SD	SH	DK
Rev. No	Date	Purpose	Prepared by	Checked By	Approved by

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## 1. INTRODUCTION



- 1.1. Mangalore Refinery & Petrochemicals Ltd (MRPL) operates a 15 MMTPA crude processing refinery with secondary units and Petrochemical complex at Mangalore.
- 1.2. Modification work is proposed at both MRPL Refinery and the PMHBL, Mangalore premises with respect to Civil, Structural, Mechanical, Piping, Electrical, Instrumentation and associated facilities as per P&IDs and other details provided elsewhere in the tender documents.
- 1.3. The entire modification work in both operating areas must comply with the following applicable central and state regulatory requirements, including, but not limited to
  - PESO
  - Oil Industries Safety Directorate regulations (OISD)
  - Directorate General of Civil Aviation
  - Central and State Pollution Control Boards standards
  - Indian Electricity Rules etc.
  - Karnataka Fuel storage and Safety Regulations and Guidelines
  - CEA – Central Electricity Authority
  - Factories Act

## 2. PURPOSE

- 2.1. The purpose of this document is to describe the Scope of Work (SOW) on item rate basis for the Tender for Modification works at the existing MRPL Refinery and the PMHBL, Mangalore premises, related to disciplines as follows:
  - a) MRPL 15 MMTPA Refinery – Modification works
    - Piping
    - Mechanical
  - b) PMHBL, Mangalore premises – Modification works
    - Piping
    - Mechanical
- 2.2. The SOW entails the execution and management of activities and provision of facilities and deliverables for
  - a. Fabrication, Construction, Installation, Erection of free issue items, Hook-up, testing, Pre-commissioning and commissioning assistance and support during Start-up and handover to the MRPL.
  - b. Procurement, Supply, Fabrication, Construction, Installation, Erection of contractor supplied items (including TPI inspection as applicable), Hook-up, testing, Pre-commissioning and commissioning assistance and support during Start-up and handover to the MRPL.

## 3. DEFINITIONS

OWNER / COMPANY / CLIENT	Mangalore Refinery and Petrochemicals Limited (MRPL)
Consultant	Nauvata Engineering Pvt. Ltd.
CONTRACTOR	SUCCESSFUL BIDDER responsible to provide relevant Engineering, Procurement, Construction and Commissioning Services on the basis of quoted re-measurable unit-rates.

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INSTALLATION	The word 'installation' wherever mentioned in this document shall mean erection, testing, pre-commissioning, commissioning and handing over of item /equipment after successful commissioning.
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#### 4. BRIEF OUTLINE OF SCOPE OF WORK

The composite Schedule of Rates includes line-item descriptions with pre filled rates and indicative quantities covering both the Modification works in MRPL Refinery and PMHBL, Mangalore premises.

The Successful Bidder will be provided with all the Engineering deliverables / drawings for below following disciplines Piping, Mechanical, as required for the execution of the job.

Contractor scope includes assistance in preparation of all “as-built” drawings on completion as part of final documentation.



##### (A) MRPL REFINERY MANGALORE

All works shall be executed under Refinery Permit to work system as per procedure detailed elsewhere in the tender documents

- (a) Installation of Free-Issue Items including all Mechanical, Piping, Electrical, Instrumentation and other associated works as follows:
- (i) Centrifugal Pumps
    - New circulation pump (GA-75001) for Product PCA.
    - New circulation pump (GA-75002) for Product PCK.
  - (ii) Cartridge Filters
    - New Cartridge Filter (FD-75001) for PCA circulation pumps (GA-75001).
  - (iii) Lubricity Dosing Packages (skid-mounted Tanks, Pumps and Instrumentation)
    - New Lubricity dosing tank and pump for PCA circulation pumps (GA-75001)
    - New Lubricity dosing tank and Pump for existing ATF pumps (GA-7007A/B)
    - New Stadis-450 dosing tank (01 No.) & its piping for PCA circulation pumps (GA-75001)
  - (iv) Pig Launcher (PL-75001) along with pig handling devices & pig indicator & transmitter.
  - (v) Manual Ball Valves
  - (vi) Manual Gate, Globe, Check Valves
  - (vii) Manual Double Block Bleed Valves
  - (viii) Motor Operated Valves
  - (ix) Automated Double Block Bleed Valves
  - (x) PSV / TSVs
- (b) Piping :
- This involves 59 Nos. Tie-ins to be conducted along with associated piping work with planned Line Shutdowns. These tie-ins / hook-up involves Hot-Tapping, Hot-Joint, and Cold-Joint. Owner / PMC will free issue all piping material, Valves, piping bulk items limited to Gaskets, Flanges, Bolts & Nuts and Piping Specialty items such as Barred-Tees & Strainers.

Contractor scope of work for free issue items includes but is no limited to:



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Piping work along with PWHT/Stress relieving, Radiography, NDT, Stage wise and final inspection by Consultant, Construction, erection, Blast cleaning, inspection, testing, insulation, fire proofing as applicable, chemical cleaning, surface preparation and painting, any additional cleaning required, fitting of internal and external attachments, pre-commissioning, hook-up, commissioning assistance, including all materials and equipment.

Scope of piping work is inclusive of draining of lines, bolt servicing, blinding, debinding, flushing, arrangement of blinds/spades (material by contractor), testing, issuing of formats, checklist liquidation, pre commissioning of lines like flushing, blowing, purging, draining (arrangement of hoses, flanges with fire hose adapter shall be arranged by contractor including material), final box up and commissioning of line; all other activities that are needed to complete the works to the satisfaction of Engineer In charge/Owner. The SOR rates quoted by bidder shall be inclusive of all the items and services mentioned above.

#### **(B) PMHBL – MANGALORE, PREMISES**

All works shall be executed under PMHBL Permit to work system as per procedure detailed elsewhere in the tender documents

##### **(a) Mechanical Installation:**

Work involves installation of a Pig Receiver (PR-1101) with hinged Closure and Pig Signaller. New Pig launcher for existing 28” MBPL pipeline and replacement of existing Normal “TEEs” with “BARRED TEEs” s in the existing 28” MBPL suction line

##### **(b) Piping :**

This involves 7 Nos. Tie-ins to be conducted with planned Line Shutdown.



Owner / PMC will issue all piping material, Valves and piping bulk items limited to Gaskets, Flanges, and Bolts& Nuts.

Piping Specialty items such as Barred-Tees and Strainers will be free-issued.

#### **5. WAREHOUSING AND MATERIAL MANAGEMENT**

Contractor scope of work for Warehouse Management and Material Control shall include but not limited to following:

- Unloading of all material from Truck and transport to storage area and to Installation site for all Contractor-sourced material.
- Loading of all materials to Truck / Trailer, Hydra / Crane and other Material Handling equipments (to be arranged by Contractor) and Transportation from storage location (Owner’s Warehouse / Yard) to Installation location for all free issue items.
- Preservation, Storage and Security for all materials free issued to Contractor.
- Receipt, Handling, identification, inspection and acceptance, storage and preservation of materials, codification of all materials.
- Documentation for Control and accounting of materials.
- Generation and upkeep of Traceability Records of Materials.
- Materials control of free issue materials.

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- Inventory Checks of free issue materials.
- Material appropriation, reconciliation and handing over of all surplus material to OWNER as per SAP Codification system after material reconciliation.
- Security, watch & ward and full Fire, Theft and Allied damages Safety as per MRPL procedure.
- Placing replacement orders for Lost / damaged / misplaced / missing items by Contractor due to the reasons attributable to Contractor at no additional time and cost to MRPL
- Any non-functional / Lost / damaged / misplaced / missing items supplied by Contractor shall be replenished by the Contractor without any time & cost implications to MRPL.
- All other material management and site transportation is in the scope of Contractor.

## 6. SURFACE PREPARATION AND PROTECTIVE COATING




All Structural Steel members will require painting as per Codes and Standards and Specifications provided elsewhere in the tender.

Fabricated pipe spools must be primer coated prior to installation and hydro-testing. After hydro-testing is completed, piping painting is done with application of intermediate-coat and final-coat painting.

Painting specifications are provided for grit-basting and application of primer, intermediate coat and final coat painting as provided elsewhere in the tender.

## 7. DETAIL SCOPE OF WORK – MECHANICAL

- 7.1. Contractor's scope includes but not be limited to execution of all jobs defined hereunder, comprising of proper storage as required at site, supply of necessary tools & tackles, Installation, Construction, inspection, testing, pre-commissioning & commissioning, and handing over of all Mechanical work complete in all respects. This Mechanical scope of work shall be read in conjunction with Scope of work for Instrumentation, Process / General, Piping, Civil and Electrical and all scope shall be completed accordingly. (Refer Tender Document for Specification, Datasheets & Manufacturing drawings.)
- 7.2. Erection/ Installation on foundation, anchoring, mechanical completion, pre-commissioning activities of Pig Launcher & Pig Receiver along with pig handling devices and pig indicator & transmitter with all its accessories, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. (Refer Tender Document for Specification, Datasheets & Manufacturing drawings.)
- 7.3. Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Cartridge Filter complete with all its accessories and support base as applicable as per Specification, Datasheets & Manufacturing drawings. (Refer Tender Document for Specification, Datasheets & Manufacturing drawings.)
- 7.4. Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Centrifugal pumps along with motors and complete with all its accessories and support base, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. (Refer Tender Document for Specification, Datasheets & Manufacturing drawings.)
- 7.5. Erection/ Installation on foundation, anchoring, Mechanical Completion, pre-commissioning activities of Dosing packages complete with all its accessories and support base, electrical items (power cables, control cables, cable glands & trays, junction boxes), instrumentation & control

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items etc., as applicable, as per Specification, Datasheets & Manufacturing drawings. (Refer Tender Document for Specification, Datasheets & Manufacturing drawings.)

7.6. Erection weight mentioned in SOR is indicative weight with +/- 20% variation anticipated.

## 8. DETAIL SCOPE OF WORK – PIPING

### 8.1. PURPOSE

- This document defines Piping scope of work for modification project of MRPL, Mangalore, India. This document shall be read in conjunction with applicable codes and standards, data sheets, specifications, and other documents attached with the Tender document.
- Contractor shall be responsible for Installation, testing, pre-commissioning and commissioning assistance of all items as per Schedule of Quantity. All statutory certification required for successful commissioning of project, shall be in the scope of Contractor.
- All installations shall be carried out as per applicable Indian Standards. Any other work not specifically stated in this document, but required to successfully execute and commission the project will be in Contractor's scope of work.
- Refer Clause 21, Contractor Responsibilities for other scope details.

### 8.2. SCOPE OF WORK – PIPING (REFINERY )

Refer Document No. 750-20005-GEN-L-DOC-0001 with brief pictorial representation of each of the Tie-ins to be performed.

#### 9.2.1. COLD TAPPING (FB-7037B TANK HEADER EXTENDED WITH NEW MANIFOLD): (CT-01)

(East of tank FB-7037B)

Activity: Tank FB-7037B (PCA storage tank), the existing manifold header line 16"-P-4703457M-A1A is being extended (CT-01) with a new line no. 16"-P-7500016-A1A, so as to incorporate new 14", 6", 4" & 8" branch as below.

- New branch line 14"-P-7500001-A1A taken from the extended header line is being routed from the new 16" manifold header up to the existing pumps GA-7004A/B (HT-06).
- New branch line 6"-P-7500003-A1A taken from the extended header line to be routed up to the tank FB-7004C.
- New branch line 8" spare line.
- New branch line for PSV-750012 (PSV: Outlet line number 4"-P-7500088-A1A & Inlet line number 3"-P-7500087-A1A) routed & connected.

Refer P&ID Number : 750-20005-P-PID-1061.



#### 9.2.2. HOT JOINT (Existing 16" line Modification to add DBBV-750102): (HJ-27A, HJ-27B) (EAST SIDE OF TANK FB-7037B)

Activity: Existing line number 16"-P-4703457M-A1A to be modified by installing New DBB Valve (DBBV-750102) as marked in below snap by Hot joint (HJ-27A, HJ-27B). Refer P&ID Number : 750-20005-P-PID-1061.

#### 9.2.3. HOT JOINT (PSV-750112 ADDED TO EXISTING LINE): (HJ-18) (East of FB-7037B TANK)

Activity: In existing 6" Xylo Rundown Line new PSV-750112 line 3"-P-7500087-A1A to be branched (Hot Joint) as marked below.

Refer P&ID Number: 750-20005-P-PID-1061.

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**9.2.4.HOT JOINT (HJ-02A, HJ-02B) (Existing 6” line Modification to add DBBV-750104): (East of FB-7037B TANK)**

Activity: The existing 6” Xylo rundown line to be modified to install new DBB Valve (DBBV-750104) by Hot Joint (HJ-02A/ HJ-02B). Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.5.HOT TAPPING : (HT-02A, HT-02B) (NEAR PUMP HOUSE 33 / FB-7005L TANK)**

Activity: From existing header (DHDT UNIT) line number 6”-P-3781045-B1A, new Hot tapping (HT-02A, HT-02B) line number 6”-P-7500002-B1A/A1A & routed along pipe racks to connect with new line number 6”-P-7500004-A1A near manifold of FB-7004C. Refer P&ID Number: 750-20005-P-PID-1061 & 750-20005-P-PID-1062.

**9.2.6.HOT JOINT: (HT-08A, HT-08B) (FROM PIPE RACK CLOSE TO FB-7001F TANK)**

Activity: From existing line number 8”-P-3871048-B1A (HCU-1/2), new line Hot Tapping (HT-08A & HT-08B) to be taken and routed to existing header with Hot Tapping (HJ-01A) (6” Xylo rundown line)  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.7.HOT JOINT : (HJ-01A, HJ-01B, HJ-01C, HJ-01D) & (HJ-22, HJ-23) (NEAR FB-7003I TANK)**

Activity: Existing line to be modified by cutting vertical raising line near to elbow & to modify elbow by turning (by cutting & welding) towards south side of Tank 7003I then it will be re-connected to existing line to FB-7003G by Hot Joint (HJ-01A) and also existing header is modified by removing existing elbow & provided with flanges & blind flanges & further below line is modified and provide new elbow by Hot Joint (HJ-01C) 6”-P-7500021-A1A and connected to new line and routed all along to existing header (8”-P-3871048-A1A)and done with Hot Tapping (HT-08A, HT-08B). TSV new line to be connected on existing line by Hot Joint HJ-22, HJ-23.  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.8.COLD TAPPING: (CT-05A, CT-05B) (NEAR FB-7037 TANK)**

Activity: Existing 36” outlet line from FB-7037 inline valve to be removed & blinded by cold tapping (CT-05A, CT-05B)  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.9.COLD TAPPING : (CT-04A, CT-04B) (NEAR FB-7037 TANK)**

Activity: Existing 6” Xylo rundown line from FB-7037B Tank to FB-7037 to be isolated by removing Valve by cold tapping (CT-04A & CT-04B).  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.10. HOT JOINT: (HJ-05A, 05B, 05C)**



Activity: Existing line from FB-7003G to be isolated (HJ-05C) by removing Tee connecting header line number 36”-P-705302-A1A and blind it other Tee Portion in the main header line shall be removed & made through(Hot joint : HJ-05A, HJ-05B).  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.11. COLD TAPPING: (CT-03) (NEAR WHITE OIL PUMP HOUSE SHED)**

Activity: Existing Tank FB-7037B (PCA Storage Tank) tank outlet line number 16”-P-4703457M-A1A to be connected with existing Pump GA-7009B & new Pump GA-75001 (16”-P-7500006-A1A) by extending existing suction line by cold tapping (CT-03).  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.12. COLD TAPPING: (CT-25, CT-22, CT-21, CT-24, CT-23) (NEAR WHITE OIL PUMP HOUSE SHED)**

Activity: Existing discharge header 12”-P-A10028-A1A is extended by cold tapping (CT-25) with new line number 12”-P-7500010-A1A & 12” valve to be removed & blinded (CT-21, CT-22) to

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isolated Existing Pump GA-7009A discharge with another Pump GA-7009B. Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.13. COLD TAPPING: (CT-24, CT-23) (INSIDE WHITE OIL PUMP HOUSE SHED)**

Activity: Existing Pump GA-7009B discharge line number 12"-P-A10028-A1A is disconnected & routed to new line number 12"-P-7500010-A1A by Cold tapping (CT-24, CT-23).  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.14. HOT TAPPING: (HT-01A, HT-01B) (NEAR WHITE OIL PUMP HOUSE SHED)**

Activity: Existing 16" re-circulation from FB-7037B tank is connected with new line number 16"-P-7500023-A1A by using hot tapping root valve (HJ-01A, HT-01B) and routed from FB-7004C tank manifold header line number 12"-P-7500029-A1A. Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.15. HOT TAPPING: (HT-03A, HT-03B) (NEAR WHITE OIL PUMP HOUSE SHED)**

Activity: Existing 12" circulation discharge to FB-7037B is connected with new line number 12"-P-7500012-A1A by Hot Tapping (HT-03A, HT-03B) routed to existing tank FB-7004C new manifold line number 12"-P-7500034-A1A.  
Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.16. HOT TAPPING: (HT-06A, HT-06B) (NEAR TO FB-7004C TANK)**

Activity: New Line number 14"-P-7500001-A1A routed from FB-7037B tank (PCA Storage Tank, new manifold) and routed to the existing 14" suction line to pumps GA-7004A/B (from FB-7004A/B/E) by Hot tapping (HT-06A, HT-06B). Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.17. HOT JOINT: (HJ-07A, HJ-07B) (NEAR FB-7004C TANK)**

Activity: New line 28"-P-7500042-A1A taken from existing line 36"-P-705302-A1A by hot tapping to existing header (28" MBPL Line and normal Tee to be replaced with Barred Tee (Hot joint HJ-07A, HJ-07B). Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.18. HOT JOINT: (HJ-06A, HJ-06B) (NEAR FB-7004C TANK)**

Activity: Existing line number 36"-P-705302-A1A modified (Hot joint-HT-06B) and connected with new line number 28"-P-7500042-A1A by hot joint (HJ-06A) routed to FB-7004C (New Pig Launcher Location) connecting to modified MBPL line by replacing Tee with Barred tee by hot tapping (HJ-07A, HJ-07B).  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.19. COLD TAPPING: (CT-07) (NEAR FB-7004C TANK)**

Activity: New Pig Launcher with line number 28"-P-7500043-A1A to be located near FB-7004C by modifying existing 28" MBPL line and by providing clearance space for access & operability of Pig Launcher (cold tapping CT-07).  
Refer P&ID Number: 750-20005-P-PID-1062.




**9.2.20. HOT JOINT (HJ-08A, HJ-08B, HJ-08C) & (HJ-29) (NEAR FB-7004C TANK)**

Activity: Existing Tee to be replaced by Barred Tee in 28" MBPL line (Pig Launcher) & also required 2" Hot Joint (HJ-29) for Pig signaler.  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.21. HOT JOINT (HJ-26A, HJ-26B) & COLD TAPPING (CT-08) (NEAR FB-7004C TANK)**

Activity: Line from existing FB-7004C tank to Pig Launcher line (28" MBPL Area) connected line number 28"-P-7500044-A1A with Tee to be replaced with Barred Tee by Hot joint (HJ-26A, HJ-26B). Refer P&ID Number: 750-20005-P-PID-1062.



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**9.2.22. HOT JOINT (HJ-9A, HJ-9B, HJ-9C) (NEAR FB-7004D TANK)**

Activity: Line from existing FB-7004D tank to Pig Launcher (28" MBPL Area) header connected line Tee to be re by Barred Tee by Hot joint (HJ-26A, HJ-26B).  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.23. HOT JOINT (HJ-10A, HJ-10B) (NEAR FB-7004F TANK)**

Activity: In existing Pig Launcher Line (28" MBPL line) after connection of FB-7004C tank Tee to be replaced with Barred Tee by Hot Joint (HJ-10A, HJ-10B) line number 28"-P-7500056-A1A.  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.24. HOT JOINT (HJ-24) (NEAR FB-7004F TANK)**

Activity: New 3" sample line for Sample collection by Hot Joint (HJ-24) from existing 28" MBPL Line from Pig launcher (PL-75001) near to FB-7004F & its drain line number 1"-P-7500047-A1A connected to existing OWS header. Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.25. HOT JOINT (HJ-41, HJ-42) & COLD TAPPING (CT-26) (NEAR FB-7004F TANK)**

Activity: Existing 28" MBPL Line from Pig Launcher having Tee inline that to be removed & line shall be made through by welding 28" Pipe Spool (Hot Joint: HJ-41, HJ-42). Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.26. HOT TAPPING (HT-07) (NEAR FB-7004C TANK)**

Activity: Existing 8" Line to FB-7004C tank to be modified to have new line by Hot Tapping (HT-07) and routed a new manifold of line number 12"-P-7500034-A1A. Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.27. COLD TAPPING (CT-06) (NEAR FB-7004C TANK)**

Activity: New Line number 12"-P-7500029-A1A to be connected to existing 12" outlet line by cold tapping (CT-06) to make as a manifold to further connections.  
Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.28. HOT TAPPING (HT-10) (NEAR FB-7004F TANK)**

Activity: New 14"-P-7500048-A1A line to be hot tapped (HT-10) from 28" FB-7004H tank header line & routed all along to connect with existing header (FB-7004F) connected line number 14"-P-700309-A1A.  
Refer P&ID Number: 750-20005-P-PID-1062 & 750-20005-P-PID-1063.

**9.2.29. HOT JOINT (HJ-28A, HJ-28B) (NEAR FB-7004D TANK)**

Activity: Line from existing FB-7004D tank to Pig Launcher (28" MBPL Area) header connected line to modify add DBBV-750109 before MOV inline by Hot Joint (HJ-28A, HJ-28B). Refer P&ID Number: 750-20005-P-PID-1062.



**9.2.30. HOT JOINT (HJ-25A, HJ-25B) (NEAR FB-7004D TANK)**

Activity: Existing line from FB-7004D to be modified to add DBBV-750110 by Hot Joint (HJ-25A, HJ-25B) in line before connecting to Existing 30" ATF Export Line. Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.31. HOT TAPPING (HT-09A, HT-09B) (NEAR TO FB-7001E TANK)**

Activity: New line number 6"-P-7500022-A1A from FB-7004C manifold line number 12"-P-7500029-A1A routed to connect with existing line Number 8"-P-3871048-B1A (HCU-1/HCU-2) by Hot tapping (HT-09A, HT-09B). Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.32. HOT JOINT (HJ-13A, HJ-13B) & (HJ-21) (NEAR TO FB-7004F TANK)**

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Activity: Existing line number 8"-P-705210-A1A (FB-7004F Tank) required to modify line by tapping Hot Joint (HJ-21) for TSV-750102 (1"-P-750058-A1A) & also Tee be taken to make new branch line number 8"-P-7500051-A1A by Hot Joint (HJ-13A, HJ-13B). Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.33. HOT TAPPING (HT-12) (NEAR TO FB-7004D TANK)**

Activity: Existing line number 8"-P-705210-A1A modified by Hot Joint & routed new line number 8"-P-7500051-A1A & routed all along to connect with existing Pump header GA-7007A/B by Hot Tapping (HT-12A, HT-12B). Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.34. HOT JOINT (HJ-14A, HJ-14B) (NEAR FB-7004F TANK)**

Activity: New DBBV-750113 to be added in 30" Existing ATF Export Pump suction line number 30"-P-705201-A1A by modifying line by Hot Joint (HJ-14A, HJ-14B) connected to FB-7004F (ATF Tank) Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.35. COLD TAPPING (CT-11) (NEAR FB-7004F TANK)**

Activity: 16" existing Manifold Header from FB-7004F to be extended by connection new line number 16"-P-7500055-A1A by Cold Tapping (CT-11) and routed to connect further more tapping's. Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.36. HOT TAPPING (HT-13A, HT-13B) (NEAR FB-7004D TANK)**

Activity: New line number 14"-P-7500052-A1A connected to new manifold line number 16"-P-7500055-A1A is routed to connect with existing Pumps Header GA-7007A/B by Hot Tapping (HT-13A, HT-13B). Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.37. HOT TAPPING (HT-11A, HT-11B) (NEAR FB-7004D TANK)**

Activity: New line number 14"-P-7500048-A1A taken Hot Tapping (HT-10) from existing 28" FB-7004H Tank to be routed all along to connect with existing marketing Pump Suction line number 14"-P-700309-A1A by Hot Tapping (HT-11A, HT-11B). Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.38. HOT TAPPING (HT-16A, HT-16B) (NEAR PUMP HOUSE 7)**

Activity: New line number 14"-P-7500070-A1A routed along existing 14" existing line (Disconnected line from FB-7037B) by Hot Tapping (HT-16A, HT-16B). Refer P&ID Number: 750-20005-P-PID-1064.

**9.2.39. HOT JOINT (HT-17) (NEAR PUMP HOUSE -7)**

Activity: New line number 14"-P-750070-A1A routed from existing 14" existing line & connected to existing KERO Suction line by Hot Tapping on 36" line (HT-17) Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.40. HOT JOINT (HJ-31 & HJ-32) (IN PETRONET AREA)**



Activity: The Existing line number 28"-P-10-1707-A1A line to be modified & blinded one end by Hot Joint (HJ-31) & other end routed with new line connecting to new PIG RECIEVER by Hot Joint (HJ-32). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.41. COLD TAPPING (CT-33) (IN PETRONET AREA)**

Activity: Existing line number 28"-P-10-1707-A1A modified to connect with Pig Launcher line accordingly TSV to be re-connected by Cold Tapping (CT-33). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.42. HOT JOINT (HJ-33) (IN PETRONET AREA)**

Activity: In existing pump (Booster pump - 10-PA-CF-101A) suction line number 16"-P-10-1102-A1A modified to accommodate new DBBV-1154 by Hot Joint (HJ-33). Refer P&ID Number: 750-20005-P-PID-1065.

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**9.2.43. HOT JOINT (HJ-34) (IN PETRONET AREA)**

Activity: In existing pump (Booster pump - 10-PA-CF-101B) suction line number 16"-P-10-1101-A1A modified to accommodate new DBBV-1155 by Hot Joint (HJ-34). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.44. COLD TAPPING (CT-31) (IN PETRONET AREA)**

Activity: Booster Pump (10-PA-CF-101A) existing line number 16"-P-10-1102-A1A to be modified to accommodate additional line number 16"-P-10-1151-A1A & DBBV-1154 connecting pump by Cold Tapping (CT-31). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.45. COLD TAPPING (CT-32) (IN PETRONET AREA)**

Activity: Booster Pump (10-PA-CF-101B) existing line number 16"-P-10-1101-A1A to be modified to accommodate additional line number 16"-P-10-1152-A1A & DBBV-1155 connecting pump by Cold Tapping (CT-32). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.46. NEW PIG LAUNCHER (PL-75001) : (NEAR FB-7004C TANK)**

Activity: As per process requirement new Pig launcher is installed by modifying existing 28" MBPL Line to provide clear space from edge of Launcher to Existing Pipe Rack. It also consists of new drain line, Kicker Line, TSV drains. Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.47. NEW PIG RECEIVER (PR-1101) : (NEAR PETRONET AREA)**

Activity: As per process requirement new Pig Receiver is located in Petronet area as identified during site survey. Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.48. NEW LUBRICITY TANK (FA-75003) & DOSING PUMP (GA-M-75004) (INSIDE PUMP HOUSE-3)**

Activity: As per process requirement new lubricity tank to be installed inside of Pump House -3 Shed in between 2 existing Pumps GA-7007A & GA-7007B BY Hot Joint to existing line numbers of pump suction like 12"-P-700356-A1A (HJ-16) & 12"-P-700357-A1A (HJ-17). Refer P&ID Number: 750-20005-P-PID-1064.

**9.2.49. NEW PUMP (GA-75002) : (INSIDE PUMP HOUSE – 3)**

Activity: As per process requirement new Pump (GA-75002) to be located inside Existing Pump House -3 Shed, both suction & discharge lines are routed all along to connect with Manifolds of FB-7004C Tank. Refer P&ID Number: 750-20005-P-PID-1064.

**9.2.50. HOT JOINT : (HJ-03A, HJ-03B, HJ-03C) FOAM CONNECTION TO EXISTING TANK FB-7037B (CONNECTED TO FB-7037B PCA STORAGE TANK)**

Activity: Additional flanges to be provide at inlet line of FOAM CONNECTION by Hot Joint (HJ-03A, HJ-03B, HJ-03C)

**9.2.51. COLD TAPPING: (CT-02A, CT-02B) (NEAR WHITE OIL PUMP HOUSE SHED)**




Activity: Existing 16" suction line from FB-7037B tank to be disconnected from Pump GA-7009A suction header by cold tapping (CT-02A, CT-02B). Refer P&ID Number: 750-20005-P-PID-1061.

**9.2.52. COLD TAPPING (CT-28 & CT-27) & HOT JOINT (HJ-43) (NEAR MRPL / HPCL AREA)**

Activity: Existing Gate Valve near MRPL/HPCL Area to be removed & replaced with new Full Bore Ball Valve by Cold Joint (CT-28) & Hot Joint (HJ-43), also 1" Thermowell shall be dismantled & blinded with new blind flange (CT-27). Refer P&ID Number: 750-20005-P-PID-1062.

**9.2.53. HOT JOINT (HJ-15A/B/C/D/E/F/G) (CONNECTED TO FB-7004F TANK)**



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Activity: Additional flanges to be provide at inlet line of FOAM CONNECTION by Hot Joint (HJ-15A/B/C/D/E/F/G)

**9.2.54. HOT TAPPING (HJ-11A, HJ-11B) (NEAR FB-7004F TANK)**

Activity: Existing manifold of Tank FB-7004F connected line number 8"-P-705205-A1A from ATF Rundown (ATF EX CDO N) to be modified & added 8" DBBV-750112 in line by Hot Joint (HJ-11A, HJ-11B). Refer P&ID Number: 750-20005-P-PID-1063.

**9.2.55. COLD TAPPING (CT-12) (NEAR PUMP HOUSE -3)**

Activity: New drain line from New Pump GA-75002 & TSV-75011 is connected to header line number 3"-P-7500041-A1A & also another line routed all along from Pig Launcher drains to header & connected to CBD Tank near Pump House-3 by cold taping (CT-12). Refer P&ID Number: 750-20005-P-PID-1064.

**9.2.56. HOT JOINT (HJ-16, HJ-17) (INSIDE PUMP STATION-3)**

Activity: New Lubricity Tank will be located inside Pump House -3 near to two existing pumps GA-7007A & GA-7007B, hence new line number 1"-P-7500069-A1A is routed to connect at suction lines of Pumps by Hot Joint (HJ-16, HJ-17). Refer P&ID Number: 750-20005-P-PID-1064.

**9.2.57. HOT JOINT (HT-35A, HJ-35B) (IN PETRONET AREA)**

Activity: New Drain line number 4"-P-10-1154-A1A from Pig receiver to be routed all along to nearby existing header line number 4"-BD-10-1158-A1A by Hot Joint (HJ-35A, HJ-35B). Refer P&ID Number: 750-20005-P-PID-1065.

**9.2.58. NEW STADIS-450 (FA-75001) TANK & LUBRICITY (FA-75002) TANK (GA-M-75003 : DOSING PUMP) (NEAR WHITE OIL PUMP HOUSE)**

Activity: As per process requirement new Stadis-450, Lubricity Tank 7 Dosing Pump will be accommodated outside of White Oil Pump House towards South side & in between White Oil Pump House Shed and CBD Tank (U/G). The lines from both Stadis-450 & Lubricity tank will be tapped to new pump suction line number 16"-P-7500006-A1A. Refer P&ID Number: 750-20005-P-PID-1061

**9.2.59. NEW PUMP (GA-75001) & CATRIDGE FILTER (FD-75001) (NEAR WHITE OIL PUMP HOUSE)**

Activity: As per process requirement new Pump GA-75001 along with Cartridge Filter connected to existing Suction Line Number 16"-P-4703457M-A1A with new line Number 16"-P-7500006-A1A & also connected to existing discharge header Line Number 12"-P-A10028-A1A with new line number 12"-P-7500010-A1A. Refer P&ID Number: 750-20005-P-PID-1061.

**8.3. SCOPE OF WORK - PIPING AT PMHBL, MANGALORE PREMISES**

Refer Document No. 750-20005-GEN-L-DOC-0001 with brief pictorial representation of each of the seven Tie-ins to be performed.



**9.3.1. HOT JOINT (HJ-31 & HJ-32)**

Activity: The Existing line number 28"-P-10-1707-A1A line to be modified & blinded one end by Hot Joint (HJ-31) & other end routed with new line connecting to new PIG RECIEVER by Hot Joint (HJ-32). Refer P&ID Number: 750-20005-P-PID-1065.

**9.3.2. COLD TAPPING (CT-33)**

Activity: Existing line number 28"-P-10-1707-A1A modified to connect with Pig Launcher line accordingly TSV to be re-connected by Cold Tapping (CT-33). Refer P&ID Number: 750-20005-P-PID-1065.

**9.3.3. HOT JOINT (HJ-33)**

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Activity: In existing pump (Booster pump - 10-PA-CF-101A) suction line number 16"-P-10-1102-A1A modified to accommodate new DBBV-1154 by Hot Joint (HJ-33). Refer P&ID Number: 750-20005-P-PID-1065.

#### 9.3.4. HOT JOINT (HJ-34)

Activity: In existing pump (Booster pump - 10-PA-CF-101B) suction line number 16"-P-10-1101-A1A modified to accommodate new DBBV-1155 by Hot Joint (HJ-34). Refer P&ID Number: 750-20005-P-PID-1065.

#### 9.3.5. COLD TAPPING (CT-31)

Activity: Booster Pump (10-PA-CF-101A) existing line number 16"-P-10-1102-A1A to be modified to accommodate additional line number 16"-P-10-1151-A1A & DBBV-1154 connecting pump by Cold Tapping (CT-31). Refer P&ID Number: 750-20005-P-PID-1065.

#### 9.3.6. COLD TAPPING (CT-32)

Activity: Booster Pump (10-PA-CF-101B) existing line number 16"-P-10-1101-A1A to be modified to accommodate additional line number 16"-P-10-1152-A1A & DBBV-1155 connecting pump by Cold Tapping (CT-32). Refer P&ID Number: 750-20005-P-PID-1065.

#### 9.3.7. NEW PIG RECEIVER (PR-1101)

Activity: As per process requirement, new Pig Receiver is located in PMHBL, Mangalore Premises as identified during site survey. Refer P&ID Number: 750-20005-P-PID-1065.

### 9. DETAIL SCOPE OF WORK – PROCESS

#### 9.1. GENERAL

The scope of work of Contractor shall include, but be not limited to manufacture / fabricate, inspection, testing, painting, transportation to site and supply of all materials, construction / erection, installation, testing, inspection, assistance in commissioning and final handover for activities mentioned below.




The Contractor's scope of work shall include, but not limited to refurbishment (cleaning, dismantling & re-installation of existing instrument, and other connections required, testing after refurbishment, painting etc.), and relocation of existing piping which are proposed to re-used and / or dismantling of existing equipment / packages/piping which are replaced with new equipment / package or discarded.

For all hook-up jobs/modification works at existing facilities contractor shall make a site visit prior to bidding.

#### 9.2. PROCESS DESCRIPTION

New Pig Receiver for existing 28" ATF pipeline (MBPL suction line from MRPL) and associated piping, instruments, CBD lines at PMHBL premises (Mangalore) (Refer to P&ID 2005-GEN-P-1065 Sht. 1 & 2)



- New Pig Receiver PR-1101 with necessary instruments, associated piping and drains shall be installed in the PMHBL premises.
- The existing 28" ATF line shall be modified by cutting and welding (HJ-31 & HJ-32) and provided with new MOV-1113N, MOV-1150, pig signaler and connected to new Pig Receiver PR-1101. (Hot work permit necessary).
- The modified 28" ATF pipeline shall be connected to the suction of existing mainline pumps 10-PA-CF-101A/B by new 20"-P-10-1150-A1A, 16"-P-10-1151-A1A and 16"-P-10-1152-A1A.

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- Existing 16" suction lines 16"-P-10-1101-A1A and 16"-P-10-1102-A1A to pumps 10-PA-CF-101A/B shall be modified to install new Motor operated DBBVs (DBBV-1154 & DBBV-1155), new "T Strainers") by cutting & welding (HJ-33, HJ-34). (Hot work permit necessary).
- The drains from pumps suction strainers, Pig Receiver and TSV outlet shall be connected to existing CBD line 4"-BD-10-1158-A1A (HJ-35).

### 9.3. QUALITY ASSURANCE AND CONTROL REQUIREMENTS

- 12.4.1. All materials before being incorporated in the work shall be inspected and if necessary tested before approval by PMC/MRPL. Any work, on which such materials are used without prior inspection (and when necessary testing) and without approval and written permission of PMC/MRPL is liable to be considered as defective and not acceptable. All Consumable test certificates need to be submitted to PMC for review before commencing the work.
- 12.4.2. CONTRACTOR shall ensure the quality of the work and good workmanship during the execution of the entire project. If any sub-standard work determined by PMC/MRPL after execution, the same shall be re tested at the risk and cost of CONTRACTOR. Any structure failing to meet the quality criteria, the same has to be dismantled by CONTRACTOR. CONTRACTOR is also responsible to reconstruct the same structure without any extra cost to MRPL.
- 12.4.3. Most of the quality control tests shall be carried out in the site laboratory set up for the purpose.
- 12.4.4. Construction CONTRACTOR shall arrange a field laboratory set up, the laboratory shall have all necessary equipment required to carry out the field tests as required as per relevant codes. If required, the PMC/MRPL may instruct to get tests done at outside approved laboratories/ third party, and such cases the Bidder shall make necessary arrangements at their own cost.
- 12.4.5. The degree of compaction required will be as per stipulation given in specification. The construction CONTRACTOR shall carry out at his own cost the required tests to prove that the soil has been compacted to the desired dry density. These tests shall be carried out at every stages/ layer wise of filling and also after entire fill height has been completed. As a general guideline, one field compaction test shall be done for every 4000 Sq.m or part thereof for each layer of fill. Additional tests other than what is stated above shall be carried out if required by the PMC/MRPL to ascertain the degree of compaction in specific areas. For earthwork filling for roads, one field compaction test shall be conducted for every 500 Sq. m for each layer of fill. Additional tests, if required by the PMC/MRPL other than what is stated above shall be carried out to ascertain the degree of compaction in specific areas. Since the degree of compaction largely depends on moisture content of soil, a close watch shall be kept on it and corrections done to optimize the moisture content. Generally, the moisture content shall be brought to within plus or minus 2% of optimum moisture content prior to rolling. The quality control operations shall include but not limited to the following items of work.
- 12.4.6. If a layer fails to meet the required density, it shall be reworked or the material shall be replaced and method of construction/ equipment altered as directed by the PMC/MRPL to obtain the desired density.
- 12.4.7. For RCC, steel testing shall be done as per the specification given elsewhere in the bid document.
- 12.4.8. For all the specific work (civil, mechanical electrical etc.) carried out by Construction CONTRACTOR, shall make quality assurance plan as well as methodology, Job procedure bar bending schedule for reinforcement etc. and get it approved by PMC/ MRPL prior to start the work.
- 12.4.9. Mix design for concrete shall be approved by PMC/MRPL. Minimum cement content for a specific grade of concrete, mentioned in the tender/ EDB shall be followed by Construction CONTRACTOR. Cube test shall be carried out for all the RCC construction as directed by PMC/MRPL. If the concrete is taken from outside RMC Construction CONTRACTOR has to OBTAIN approval for the same. All the quality documents shall be handed over to PMC/MRPL with the final documentation, as per MRPL documentation standard procedure.
- 12.4.10. Construction CONTRACTOR shall be responsible to ensure the quality of products listed in approved list of makes/brands. CONTRACTOR shall have to replace the defective & sub-standard

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materials at his own cost. Vendor list of materials provided in the tender are approved subject to meeting the tender specification & site requirement. The sample of the materials shall in either case have to be got approved from PMC before procurement. Material where no make/brand has been mentioned, in that case ISI marked sample shall be submitted by the CONTRACTOR for approval of Engineer in charge. For any item not covered in the approved vendor list, the CONTRACTOR shall get the make & sample approved from PMC/MRPL before procurement. The final choice of make to be used in the works will rest with PMC/ MRPL & the decision of PMC/MRPL shall be final & binding on the CONTRACTOR in this respect.

- 12.4.11. Construction CONTRACTOR shall ensure the quality of civil and all other inter-disciplinary works by engaging a third party supervision /inspection and provide test results to PMC/MRPL for information. CONTRACTOR has to submit his Quality Assurance Plan for review / approval by PMC/MRPL.



## 10. ENVIRONMENT, HEALTH AND SAFETY REQUIREMENTS

- 10.1. Construction CONTRACTOR shall adhere to the policies, guidelines and practices referred by the MRPL. The CONTRACTOR shall also submit his HSE policies and HSE plan for the project.
- 10.2. Construction CONTRACTOR shall supply and install all types of area barricading / protective shielding / sheeting up to require for carrying out testing activities within the existing plant and pipe rack and other facilities when the plant is in operation or having shut down.
- 10.3. Construction CONTRACTOR shall seek any hot work permit and other necessary permits from the PMC and strictly observe plant safety guide lines as imposed from time to time by the PMC/MRPL.
- 10.4. As work is carried out inside an on-going refinery premises, full adherence to accepted Refinery safety procedures is a strict requirement. This includes but is not limited to working at elevations, PPE and safety harnesses, Vessel entry permits, working in confined locations, electrical isolation procedures, hot-work permits, radio-active source permits and guidelines. CONTRACTOR to adhere to Refinery Permit-to-Work system and provide additional manpower for this requirement.
- 10.5. CONTRACTOR shall ensure safe working within the plant boundary (where applicable) without any damage to the existing facilities. However, in case of any damage, CONTRACTOR shall make good and restore to the original condition without any loss to OWNER as per the schedule specified by PMC/OWNER. In case of delay in making good the damages, PMC/OWNER reserves the right to make good and restore the site to the original condition at the risk and cost of CONTRACTOR.
- 10.6. CONTRACTOR shall ensure that all the safety procedures are followed during erection, testing and commissioning. All the safety norms as per OISD 192 and OISD 207 shall be followed.
- 10.7. Work permits like hot, cold, height, excavation, road cutting, radiography etc shall be taken from respective agencies/companies/authorities for jobs to be executed in their premises for which CONTRACTOR to follow rules and regulations of those agencies/companies/authorities.
- 10.8. All required PPE for the execution of the job shall be in the scope of CONTRACTOR.

## 11. APPROVALS

- 11.1. Contractor shall liaison with Chief Controller of Explosives (CCOE, India) under Petroleum rules and SMPV rules, Tariff Advisory Committee (TAC) accredited agency, DGCA (Director General & Civil Aviation), and state and Local Authorities, CEA and assist the MRPL in obtaining all necessary approvals. Contractor shall comply with the requirement of these authorities irrespective of, if it is mentioned or not in the bid document & shall form part of Contractor's scope of work including preparation of required drawings/ documents to be submitted to the statutory/government authorities.
- 11.2. Contractor shall comply with the requirement of local bodies including preparation of required drawings/ documents. Any change/ modification required by these authorities shall be carried out by Contractor without any time and cost implication.



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11.3. This includes assisting MRPL in obtaining approval of drawings/documents from various statutory agencies, wherever applicable including preparation and updating of drawings /documents and liaison works with authorities and co-ordination with PMC/MRPL.



## 12. APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

Note: PMC/MRPL specifications shall be followed where equivalent Indian standards are not available in specific cases.



- 12.1. In the event of conflict between codes being used, the most stringent one is followed.
- 12.2. All design documents shall be drafted based on International Standards or equivalent Indian Standards. However, Indian Standard shall be used only.
  - Where required by regulation or Indian law.
  - Where they are more stringent than international Standards.
  - Where there is no suitable international Standard.
- 12.3. If Indian standards are legally required, but are less stringent than the corresponding International Standards, the international standard is followed. The definition of most stringent is that approved by MRPL. Refer order of precedence to be followed as specified elsewhere in the bid package.
- 12.4. Construction CONTRACTOR shall follow the latest revision of all Documents, Specifications, Codes and standards shall be the latest edition including latest addenda unless otherwise specified in the documents.
- 12.5. In cases where no specific requirements are given or referenced in this specification for a specific component, Construction CONTRACTOR shall adhere to internationally accepted design and engineering practices.
- 12.6. Minimum list of Codes and Standards that are required to be followed for this Project are indicated in the below table for reference purposes:

Note: IEC specifications shall be followed where equivalent Indian standards are not available in specific cases.



Sl. No.	Document No.	Title
1	IS 13234	Guide for short circuit calculations in three phase AC systems
2	IS 12360	Voltage bands for electrical installation including preferred voltages and frequencies
3	IS 3043	Code of practice for earthing
4	IS 3716	Application guide for Insulation coordination
5	IS 732	Code of practice for electrical wiring installations
6	IS 6665	Code of practice for industrial lighting
7	IS 3646	Code of practice for Interior illumination
8	IS 2309	Code of practice for the Protection of buildings and allied structures against lightning
9	IS 1646	Code of practice for fire safety of buildings – Electrical installations
10	IS 10118	Code of practice for selection, installation and maintenance of switch gear and control gear

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Sl. No.	Document No.	Title
11	IS 5216	Guide for safety procedures and practices in electrical work
12	IS 5571	Guide for selection of electrical equipment for hazardous area
13	IS 5572	Classification of hazardous areas having flammable gases and vapours for electrical installations
14	IS 7689	Guide for control of undesirable static electricity
15	IS 325	Specification for Induction Motors
16	IS 8478	Application guide for on load tap changers
17	IS 9676	Reference Ambient Temperature for Electrical Equipment
18	IS 10028	Code of practice for selection, installation and maintenance of transformer
19	IS 11064	Guide for construction and use of rooms or buildings protected by pressurization for installation of electrical apparatus for explosive gas atmospheres
20	IS 13346	General requirements for electrical apparatus for explosive gas atmosphere
21	IS 13408	Code of practice for selection, installation and maintenance of electrical apparatus for use in potentially explosive atmosphere
22	IS 14154	Electrical apparatus with protection by enclosure for use (Part 1 and 2) in the presence of combustible dusts
23	IS 14774	Resistance trace heating in potentially explosive (Part 1 and 2) atmospheres
24	IS 15142	Guide to use of electrical apparatus for potentially explosive atmospheres in the presence of combustible dusts
25	IS 3961	Recommended Current ratings for cables
26	IS4201	Application guide for CT
27	IS 3842	Application guide for electrical relays for AC systems
28	IS 4146	Application guide for VT
29	IS 1255	Code of practice for installation & maintenance of power cables up to and including 33kV rating
30	IS 2026	Oil Filled Transformers
31	SP 30	National Electrical Code (NEC) – BIS publication
32	OISD STD 110	Recommended practices on static electricity
33	OISD STD 113	Classification of Area for electrical installation at Hydrocarbon and handling facilities
34	OISD STD 118	Layouts for Oil and Gas Installations
35	OISD STD 147	Inspection and safe practices during Electrical installation
36	OISD STD 244	Storage and Handling of Petroleum Products at Depots and Terminals



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Sl. No.	Document No.	Title
37	OISD STD 149	Design aspects for safety in electrical systems
38	OISD STD 173	Fire protection systems for electrical installations
39	OISD STD 180	Lightning Protection
40	IS/IEC 60079-0	Electrical apparatus for hazardous area - General requirements
41	API STD 610	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
42	ASHRAE handbooks	HVAC Applications, Systems, Fundamentals And Equipment
43	ASHRAE 33	Methods of Testing Forced Circulation Air Cooling and Air Heating Coils
44	ANSI/ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy
45	ANSI/ASHRAE Standard 62.1	Ventilation for Indoor Air Quality
46	ANSI/ASHRAE/IES Standard 90.1	Energy Standard for Buildings Except Low- Rise Residential Buildings
47	ASHRAE Standard 52.2	Method of Testing General Ventilation Air- Cleaning devices for Removal Efficiency by particle size
48	DW/142	Specification for Sheet Metal Duct Work: Low, Medium and High pressure/Velocity air Systems-Addendum A
49	DW/143	Ductwork Leakage Testing
50	DW144	Specification for Sheet Metal Ductwork
51	SMACNA	SMACNA Duct Standard
52	AMCA	AMCA Fan Application Manual AMCA
53	AMCA-210	Laboratory method of testing fans AMCA 500
54	AMCA- D	Laboratory method of testing dampers AMCA 500
55	AMCA- L	Laboratory method of testing louvers
56	ISA 71.04	Environmental Conditions for Process Measurement and Control Systems – Airborne Contaminants
57	BS EN 779	Particulate Air Filters for General Ventilation – Determination of the Filtration Performance
58	NFPA 90A	Installation of Air Conditioning and Ventilation Systems
59	NFPA 92	Standard for Smoke Control Systems
60	NFPA 92A	Standard for Smoke-Control Systems utilizing barriers, airflows, and pressure differential
61	IEC 60079-14	Electrical Apparatus for Explosive Gas Atmospheres
62	IEC 60529	Classification of degrees of protection provided by enclosures
63	IEC 60034	Rotating Electrical Machines
64	EN 10204	Metallic products



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Sl. No.	Document No.	Title
65	UL 555	Standard for Fire Dampers
66	UL 555S	Standard for Safety Smoke Dampers
67	AHRI 360	Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment
68	AHRI 365	Performance Rating of Commercial and Industrial Unitary Air-Conditioning Condensing Units
69	AHRI 410	Forced-Circulation Air-Cooling and Air-Heating Coils
70	AHRI 430	Performance Rating of Central Station Air-Handling Units
71	IBC	International Building Code
72	API 650	Welded Tanks for Oil Storage
73	API 674	Positive Displacement Pumps— Reciprocating
74	API 675	Positive Displacement Pumps — Controlled Volume for Petroleum, Chemical, and Gas Industry Services
75	API 676	Positive Displacement Pumps—Rotary
76	API 682	Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps
77	API 613	Special Purpose Gear Units for Petroleum, Chemical, and Gas Industry Services
78	API 615	Sound controls of mechanical equipment for refinery service
79	API 677	General-Purpose Gear Units for Petroleum, Chemical and Gas Industry Services
80	API 671	Special-purpose Couplings for Petroleum, Chemical, and Gas Industry Services
81	API 614	Lubrication, Shaft-sealing and Oil-control Systems and Auxiliaries
82	API 660	Shell and Tube Heat Exchanger
83	API 670	Machinery protection system
84	API 1004	Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles
85	API 421	Separator is a gravity-type oil-water separator designed for use in petroleum refineries
86	API RP 652	Linings of Aboveground Petroleum Storage Tank Bottoms
87	API Std. 2000	Venting Atmospheric and Low-Pressure Storage Tanks
88	API-RP 2003	Protection Against Ignition Arising Out of Static, Lightning and Stray Currents
89	API RP 2350	Overfill Protection for Storage Tanks in Petroleum Facilities
90	ASHRAE Standards	American Society of Heating, Refrigeration and Air Conditioning Engineers
91	ASME SEC. VIII DIV.1	Rules for construction of pressure vessels
92	AGMA	American Gear Manufacturer's Association





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Sl. No.	Document No.	Title
93	ASME SEC. II	Boilers and Pressure Vessel Code- Materials, Material Specification
94	ASTM/IS	For material specification
95	ASME SEC. IX	Welding, Brazing, and Fusing Qualifications
96	ASME 16.20	Metallic Gaskets for Pipe Flanges
97	ASME B 16.5	Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24
98	ASME B 16.47	Large Diameter Steel Flanges NPS 26 Through NPS 60
99	ASME B 31.3	Process Piping
100	AMCA-210	Laboratory Method of Testing Fans for Rating purposes
101	BS -5445	Components of Automatic Fire Detection Systems
102	BS -5446	Fire detection and fire alarm devices for dwellings
103	BS- 5839	Fire detection and alarm systems for buildings
104	BS EN 779	Particulate air filters for general ventilation Requirements, testing, marking.
105	BIS IS 2825	Code for Unfired Pressure Vessels
106	IS 875	Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures
107	IS 1893	Criteria for Earthquake Resistant Design of Structures, Part 1: General Provisions and Buildings
108	IS 1893 (Part 1)	Criteria for Earthquake resistant design of structures – General Provisions.
109	IS 1893 (Part 4)	Criteria for Earthquake resistant design of structures – Industrial Structures.
110	IS 4894	Centrifugal Fan
111	IS 3588	Electrical Axial Flow Fans
112	IS 2312	Propeller type A.C. Ventilating Fan
113	IS 2494	V -Belts for Industrial Purposes
114	IS 3142	V -Grooved Pulleys
115	IS 3103	Code of Practice for Industrial Ventilation
116	IS 277	Galvanized Steel sheet
117	IS 2062	Steel for general structural purposes
118	IS 655	Specification for Metal Air Ducts
119	ISO 8573-1	Compressed air — Part 1: Contaminants and purity classes
120	ISO 3046 - 1 to 6	Reciprocating Internal Combustion Engines
121	ISO 8528 – 1 to10	Reciprocating internal combustion engine driven alternating current generating sets
122	ISO 1940	Mechanical vibration — Balance quality requirements for rotors in a constant (rigid) state — Part 1: Specification and verification of balance tolerances

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Sl. No.	Document No.	Title
123	OISD 108	Recommended Practices on Oil Storage and Handling,
124	OISD 115	Guidelines on Fire Fighting Equipment and Appliances in Petroleum Industry
125	OISD 192	Safety Practices during Construction
126	OISD 197	Guidelines for Environmental Impact Assessment
127	OISD 203	Operation, Maintenance & Inspection Of Hoisting Equipment
128	OISD 207	CONTRACTOR Safety
129	OISD 113	Classification of Area for electrical installations at Hydrocarbon processing and handling facilities
130	OISD 122	Selection, Operation and Maintenance of Fans, Blowers, Gear Boxes, Agitators & Mixers
131	OISD 123	Selection, Operation and Maintenance of Rotary Equipment Components
132	OISD 106	Pressure Relief & Disposal System
133	OISD 109	Process Design and Operating Philosophies on Blow Down & sewer system
134	OISD 117	Fire Protection Facilities for Petroleum Depots, Terminals, Pipeline Installations and Lube Oil Installations
135	WHO	World Health Organization Standards for Drinking Water
136	NSF/ANSI 61	Drinking water System Components-Health Effects
137	NFPA 2001	Standards on Clean Agent Fire Extinguishing Systems.
138	NFPA 11	Standard for Low-, Medium-, and High-Expansion Foam
139	NFPA 13	Standard for the Installation of Sprinkler Systems
140	NFPA (fire) 329	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases
141	NFPA 15	Standard for Water Spray Fixed Systems for Fire Protection
142	NFPA 20	Standard for the Installation of Stationary Pumps for Fire Protection
143	NFPA 70	National electric code
144	PNGRB/Tech/7-T4SP(1)/2020	TECHNICAL STANDARD AND SPECIFICATION FOR PETROLEUM AND NATURAL GAS REGULATORY BOARD
145	NFPA 72	National fire alarm code
146	TTMA (Tank Truck Manufacturer's Associations)	
147	M B Lal committee recommendations	
148	TAC (Tariff Advisory Committee)	
149	Clean Agent manufacturer's recommendation	

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Sl. No.	Document No.	Title
150		Clearance for handling & storage of Petroleum Products Chief Controller of Explosives (CCOE) / Petroleum and Explosives Safety Organization (PESO)
151		Clearance from Environment / Pollution board State Pollution Control Board &CPCB
152		Clearance of the Ministry of Environment Forests following consideration of the Environment Impact Assessment & Environment Management Plan pursuant to Sections 3(1) & 3(2) (v) of the Environment (Protection) Act, 1985 and Rules 5(3)(a) of the Environment(Protection) Rules, 1986
153		Approval of Chief Engineer Inspector Consent under the Factories ac 1948 relating to firefighting capability
154		Consent of the controller of explosives to the possession and use of explosives for the purpose of blasting
155	Fire Service	Government of Karnataka
156	CPWD / PWD	Government of Karnataka
157	OISD Audit	Oil Industry Safety Directorate
158		The Air (Prevention and Control of Pollution) Act,1981 incorporating the National Ambient Air Quality Standards Central Pollution Control Board Notification dated 18 <sup>th</sup> November2009
159	IS 456	PLAIN AND REINFORCED CONCRETE CODEOF PRACTICE
160	IS 800	GENERAL CONSTRUCTION INSTEEL — CODE OF PRACTICE

### 13. FINAL HOOK-UP, TIE-IN, PRE-COMMISSIONING, COMMISSIONING AND START-UP HAND OVER:



Quoted unit-rates must include for final hook-up, pre-commissioning, commissioning and start-up with introduction of hydro-carbons.

### 14. COMPLETENESS OF WORK/CONTRACT

The scope of work mentioned in the contract/Bid is not the comprehensive one, but gives total idea/outline of the scope of work, however CONTRACTOR shall be responsible for completeness of the job for the purpose indicated elsewhere to make the system fully functional and operational.

If there is any conflict in the specifications appearing in different contractual documents. Then the specification whichever is stringent shall be applicable without any technical or commercial implications. The work furnished shall be complete in every respect with all mounting, fittings, fixtures and standard accessories etc. normally provided for such item/equipment and or needed/required for erection, completion and safe operation of the item/equipment/system as required by applicable codes though they may not have been specifically detailed in the respective specifications, unless included in the list of exclusions.

Any additional items and materials which are not specifically mentioned but are required to complete the system offered, in every respect in accordance with the technical specifications and required for safe operation and guaranteed performance shall also be deemed as included in the scope of work of this tender. CONTRACTOR shall not be eligible for any extra payment in respect of such mountings, fittings, fixtures, and accessories etc. which are needed/required for safe operation of the item / equipment/system, as required by applicable codes of the country though they may not have been explicitly spelt out in the Bid / Contract.

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## 15. TEMPORARY FACILITIES

The temporary facilities (as applicable) to be provided by Contractor but not limited to:

- Security fence/gate and security at construction stage for Contractor's materials.
- Contractor's site offices
- Temporary toilets, urinals and washrooms for his labors
- Fabrication/ Workshop areas including shot blasting and painting areas
- Construction water storage and distribution
- Construction power and distribution
- Hydro test water supply and disposal.
- Fire-fighting equipment
- Field testing and calibration laboratory
- IT and communication facilities
- Local Transportation for all Contractor manpower.
- Canteen for staff and workers as per rules and regulations applicable inside PROJECT SITE.
- Temporary roads including access roads, fencing and gates
- Miscellaneous workshops
- Parking space for all construction equipment with repair workshop
- Area Lighting
- Air-conditioned storage for paint storage
- First Aid and medical / health care facilities.
- Temporary drainage systems including that for heavy rains in monsoon.
- Laboratory for field testing of civil/structural items.
- Labor facilities shall be arranged outside the Plant premises at the Contractors own cost.
- Prior approval from PMC/MRPL shall be obtained by Contractor for all temporary facilities to be provided by the Contractor.

All utility consumption is payable by the Contractor.

## 16. FREE ISSUE MATERIALS TO BE SUPPLIED BY MRPL



Free issue items supplied by MRPL, have been listed below and unloading of the below mentioned items shall be in the bidder's scope.

Free issue items are as mentioned below,

1. Tank Modification supplies.
2. Centrifugal pumps
3. Cartridge filters
4. Dosing package (Tanks, pumps and associated instruments)
5. Pig launcher and Receiver
6. Manual Ball Valves
7. Manual Gate, Globe and Check Valves
8. Manual DBBV
9. Pipes (All sizes)
10. Piping Bulk Items (Gaskets, Flanges, Bolt and Nuts, Strainer, Barred Tee etc.)
11. Motor Operated Valves
12. Automated DBBV's
13. Pig Launcher & Receiver and its associated items.



## 17. CONTRACTOR RESPONSIBILITIES

- 21.1 Construction of all Piping & Mechanical works including all material, labor, supervision, tools and tackles etc. shall be carried out by CONTRACTOR.



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- 21.2 Procurement and supply of all materials as per the approved vendor list shall be in the scope of CONTRACTOR.
- 21.3 All materials and construction shall confirm to the specification given elsewhere in the bid document.
- 21.4 All materials procured for construction must be of ISI approved brand.
- 21.5 Materials of construction, construction method etc. Shall protect the structures and foundations against any harmful effect of chemical, fumes etc. present in the plant, its vicinity, in ground and /or subsoil water.
- 21.6 CONTRACTOR shall ensure that the facilities are constructed in accordance with the APPROVED FOR CONSTRUCTION drawings and specifications.
- 21.7 CONTRACTOR shall be responsible for obtaining the statutory approval from local authorities such as Inspector of Factories, Development Authorities, Municipal Corporation and other concerned authorities before starting the work.
- 21.8 CONTRACTOR shall redo/ repair all the existing facilities viz. roads, paving, drainage etc. which are damaged during transportation, construction and erection activities performed by him.
- 21.9 Modification work involving draining, flushing and hand over of line to hot work requires blinding/de-blinding of the loops shall be in the bidder's scope.
- 21.10 Spades required for Blinding and De-Blinding shall be in the bidder's scope.
- 21.11 Scope should include lifting of materials from Owner/PMS storage yard;
- 21.12 Resources for lifting materials from Store shall be arranged by Contractor;
- 21.13 Tie ins shall mean Hot tapping, Cut & Weld tapping, Cold tapping as per drawings;
- 21.14 Scope of piping work is inclusive of draining of lines, bolt servicing, blinding, deblinding, flushing, arrangement of blinds/spades (material by contractor), testing, issuing of formats, checklist liquidation, pre commissioning of lines like flushing, blowing, purging, draining (arrangement of hoses, flanges with fire hose adapter shall be arranged by contractor including material), final box up and commissioning of line; all other activities that are needed to complete the works to the satisfaction of Engineer In charge/Operations; The SOR rates quoted by bidder shall be inclusive of all the items and services mentioned above. No separate payment shall be made for the same.
- 21.15 Blinding with spades on either side/multiple sides of hook up location before carrying out hot work/tapping;
- 21.16 All activities shall be carried out under MRPL/PMHBL work permit system adhering to all safety procedures ;
- 21.17 Contractor shall arrange sufficient number of LEL meters, Intrinsically safe mobile phones for safe execution of works within refinery premises;
- 21.18 There will be interruption during execution of works as per Operation requirements/ Operation exigencies etc. No claim on account of the same will be accepted.
- 21.19 Scaffolding required for welding and cutting shall be in bidder's scope.
- 21.20 Bidder shall arrange sufficient DG sets to cater the requirements for construction power.
- 21.21 CONTRACTOR shall also coordinate with manufacturer of equipment supplied by contractor (if any), wherever required, and shall freely and readily supply all technical information for this purpose as and when called for.
- 21.22 In case of any discrepancy or contradiction either in Engineering Design Basis, or in Standard Drawings / Standard specifications given by PMC/Owner in the BID, it is deemed mandatory to follow the requirements of relevant National / International design codes / standards, local statutory rules / OISD guide lines or client's standard practice being followed in existing premises. CONTRACTOR shall also consult PMC for further clarification.
- 21.23 CONTRACTOR shall be fully responsible for flushing, cleaning and purging of the system including supply of all skilllets, gaskets, blinds, chemicals, etc. and making gas free for taking up the modification jobs from safety considerations.
- 21.24 The flushing, cleaning and purging operations shall be done under the supervision of PMC / MRPL's Representative and procedures are subject to approval by PMC / MRPL. Supply of the media / fluids required for flushing, cleaning and purging shall be arranged by CONTRACTOR shall specify the requirement of media / fluids in the Bid.





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- 21.25 CONTRACTOR shall conduct pre-engineering site survey to finalize the exact scope of work and to familiarize with the available material handling facilities such as mobile crane, monorails, and approach routes at the modification locations to facilitate the dismantling, removal, installation works and subsequent maintenance works of the new equipment after modifications are executed and completed.
- 21.26 CONTRACTOR during the execution of the work may have to remove temporarily some of the items. Accordingly disconnection, dismantling, storage and re-installation including reconnection, reorientation shall be in CONTRACTOR's scope. If needed the item of similar specification shall be supplied and installed by the Contractor with the approval of MRPL/ PMC.
- 21.27 OEM vendors shall be present during installation, testing and commissioning of the major equipment in this package wherever required. CONTRACTOR responsibility is to coordinate with other contractors for the assistance during equipment commissioning.
- 21.28 Any arrangement required inclusive supply of water, pumps and laying of lines for carrying out hydrotest and drinking water connection to be done by the contractor.
- 21.29 CONTRACTOR shall be responsible for supply and installation of all kind of sign indications boards within the Project Site. List is as follows but not limited to:
- Danger/warning/caution boards,
  - Guidelines and indications in case of any emergency,
  - Display boards of SOPs at various operating areas,
  - Equipment details with tag numbers,
  - MSDS of chemicals used.
  - Underground facility indications as per standards.
- 21.30 CONTRACTOR shall prepare QA/ QC manual, inspection test plans, Heat treatment procedure, Surface Preparation and protective coating procedure, Hydro test procedure, Pneumatic test procedure, Pickling and Passivation procedure, as applicable, Cladding procedure, as applicable, NDT procedures, storage and preservation procedures, Welding procedures & PQRs and welders qualifications for PMC review and approval. All test pieces for welding WPS, PQRs and welder qualification tests must be procured for testing well in advance.
- 21.31 CONTRACTOR shall ensure, all as-built drawings and documents are submitted during final documentation as per agreed procedure. Documentation shall be checked for its correctness and completeness at the time of handing over of any plant / system / unit.
- 21.32 CONTRACTOR shall ensure that final documentation including drawings generated from CONTRACTOR, as-built drawings, documents, field inspection documents, records, vendor documents, statutory drawings/documents are submitted as per final documentation procedure.
- 21.33 Refrigerated storage (as applicable) of paint and thinner material is included in the scope of CONTRACTOR.
- 21.34 Blast cleaning to be conducted in a segregated area as per safe industry practices.
- 21.35 All temporary gaskets, pipe-spools, bracings and other material used during pre-commissioning is in the scope of supply of CONTRACTOR.
- 21.36 The fabrication and installation shall be in conformity with regulations of PESO, OISD, PNGRB, IQCM guidelines and other statutory bodies. CONTRACTOR shall render necessary assistance to the client during inspection by OISD (Pre & Post) or other statutory authorities without additional cost.
- 21.37 All welding electrodes, filler wires, flux etc. (as per approved vendors). Storage of electrodes must be by CONTRACTOR as per Code.
- 21.38 All Shims, wedges and packing plates.
- 21.39 All packing materials, such as wooden sleepers, rafters, planks, ropes, all type of nails, clamps and such other items which may be necessary for packing, loading transportation and unloading of equipments / machinery and pipe fittings.
- 21.40 All measuring, testing, calibrating instruments and equipment for the completion of the job.
- 21.41 All scaffolding required shall be in the scope of Contractor including supply of materials. Internal and external scaffolding for working at higher elevation to be provided strictly as per relevant standards safety regulations / norms and stringent of these norms / standards shall be implemented.



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- 21.42 The Welding Engineer of the agency carrying out radiographic examination shall submit the radiographic films together with his findings, report and recommendation as to the acceptability or otherwise of welds radiographer to the PMC Site Engineer.
- 21.43 Contractor shall ensure that final documentation including drawings and documents generated by Contractor and for vendor supplied equipment/packages, as-built drawings, documents, field inspection documents, welding and testing records, pre-commissioning check-sheets, records, vendor documents, statutory drawings / documents are submitted as per final documentation procedure.
- 21.44 Contractor shall strictly follow the supplier / OEM recommended preservation procedures during the period of storage for all installed and uninstalled equipment. Storage requirements are indicated in respective Supplier / OEM specifications and Engineering Design Basis.
- 21.45 All safety, security and control of project material and stored items is to the account of Contractor.
- 21.46 A project materials and construction equipment laydown must be maintained with repair work-shop for all equipment and vehicles.
- 21.47 Installation shall include installation of equipment, leveling, aligning, grouting etc. All fastening hardware (including anchor bolts and templates) required within the package site shall be by Contractor.
- 21.48 Supply of construction materials like scaffolding, consumables, Short blast cleaning and painting shop, all weather fabrication sheds, X-ray and Radiography sources, Automatic welding machines, Stress relieving equipment with recording facility etc. , supply of flanges, valves, bolts, nuts, gaskets, spectacle blinds, temporary supports for the purpose of isolation of equipment during removal stage, labor and labor supervision, arranging boarding and lodging for the Contractor's personnel at site, tools, tackles, cranes for heavy lifts, chain pulley blocks, consumables and accessories not specifically mentioned herein but nevertheless necessary, as per OWNER / Consultant for the fabrication, construction, installation, mechanical completion, testing and commissioning of the complete system including the cranes or any other material handling equipment is also part of LSTK scope of works.
- 21.49 Fabrication, lifting, laying, erection, bolt torqueing, supporting and installation, pre and post weld heat treatment, inspection, non-destructive testing including radiography and hydrostatic test, water flushing, air drying, nitrogen purging and other testing of piping installations, above and below ground. Installation of all valves and other miscellaneous in line/on line items is also included. Open ends of piping, valves shall be protected with wooden blanking plates securely fastened with wire or by plastic insert plugs. All rust preventatives and additives for hydro-test water is to the account of CONTRACTOR. Disposal of hydro-test water and flushing media must be done by CONTRACTOR as per Refinery accepted procedures.
- 21.50 Electrical continuity across flange joints shall be maintained by providing metallic gaskets or jumpers.
- 21.51 Any installation accessories like MCC Feeders, Junction boxes, relays, circuit-breakers, pull boxes, nails, screws, bolts, nuts, clamps, mounting brackets/down- rods, raw-plugs (Anchor bolts), Fan hooks/boxes, cable trough required for complete lighting installation, lightning protection as applicable.
- 21.52 The CONSTRUCTION CONTRACTOR shall develop this package to Approved for Construction (AFC) status taking due account of the Engineering Design Basis, Job specifications, standard specifications, standard drawings and any information given in this Tender document.
- 21.53 The descriptions and requirements contained in this specification are concise by necessity and cannot include all details. However, it is the responsibility of the CONTRACTOR to execute the job on a turnkey basis in accordance with the specifications and internationally recognized good engineering practices for smooth and successful operation of Refinery.
- 21.54 Contractor shall submit all documents as per the agreed schedule. Shall include drawings/documents listed elsewhere in this tender as minimum requirements for submission to MRPL/PMC for approval or review or information. Contractor shall provide documentation keeping a review time by MRPL/PMC of ten (10) working days to enable them to review and make comments. CONTRACTOR shall take action in a timely fashion, with respect to all drawings, documents and other necessary information. Contractor shall respond to MRPL/Consultant observations/comments within reasonable time not exceeding seven (7) working days.

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- 21.55 CONTRACTOR shall provide proper clarification/explanation to MRPL/PMC personnel during all phases upon request by MRPL/PMC for monitoring the Construction CONTRACTOR's Work.
- 21.56 Construction CONTRACTOR shall supply special tools & tackles required for construction, operation and maintenance, and initial charge of all consumable required for execution of the job.
- 21.57 Construction CONTRACTOR shall relocate/remove, clear or demolish obstacles aboveground and underground within the SITE, wherever required and with prior approval of PMC/MRPL and without any commercial implications to the MRPL.
- 21.58 The Soil investigation report enclosed in the tender document is indicative and it is furnished only to indicate the soil condition at site.
- 21.59 Construction CONTRACTOR shall maintain all areas required for temporary storage, construction facilities, medical facilities, toilets with proper hygiene and other construction infrastructures for all construction labourers deployed by them.
- 21.60 It is Mandatory in this project that the Construction CONTRACTOR shall provide all the basic amenities at site like toilet (for Ladies and gents), canteen (basic requirements only), Change rooms etc., for the skilled and unskilled workers. Construction CONTRACTOR shall consider this cost before submitting the price bid. And all these costs are deemed to be considered in the quoted unit-rates. Construction CONTRACTOR will be penalized if he fails to furnish the basic facilities at Construction site.
- 21.61 Construction CONTRACTOR shall ensure safe working within the plant boundary (where applicable) without any damage to existing facilities. However, in case of any damage, Construction CONTRACTOR shall make good and restore to the original condition without any loss to MRPL as per the schedule specified by PMC/MRPL. In case of delays in making good the damages, PMC/MRPL reserves the right to make good and restore to the original condition at the risk and cost of Construction CONTRACTOR.
- 21.62 Construction CONTRACTOR shall provide all required construction equipment, tools, tackles, instruments duly calibrated, and consumables inclusive of erection to enable all construction, pre-commissioning and commissioning work to be carried out.
- 21.63 Construction CONTRACTOR shall be responsible for the total disposal of construction waste materials generated by them and final site clearance including removal of temporary facilities in compliance with local regulations and as per directions of PMC/MRPL. As regards to left over useable material including bulk material, Construction CONTRACTOR shall duly codify the same as per the MRPL's guidelines and return to the MRPL without any extra cost to MRPL.
- 21.64 Construction CONTRACTOR shall construct the facilities in accordance with the approved drawings and contract specifications and in compliance with safety rules and local regulations in force.
- 21.65 Construction CONTRACTOR shall carry out internal technical and safety audit at various stages of construction to verify and ensure that quality and safety requirements of the facilities are adhered to. Reports for the same shall be submitted for MRPL/PMC's review.
- 21.66 The Construction CONTRACTOR shall be fully responsible for proper setting out works, profiling in excavation, stacking, etc. taking adequate safety measures etc. The CONTRACTOR shall carry out all works meant within the intent of this work even if not explicitly mentioned herein. All works shall be executed to the satisfaction of the PMC/MRPL.
- 21.67 Fences, signs, monuments, buildings, pipelines, drains, sewers or other surface or subsurface systems/drainage facilities within or adjacent to the works being carried out are not to be disturbed, shall be protected from damage by the Construction CONTRACTOR. The CONTRACTOR shall provide and install suitable safeguards approved by the PMC/MRPL for this purpose.
- 21.68 Excavated material if permitted by PMC shall be used for filling/ backfilling. Unsuitable material/excess material shall be disposed-off outside the project site. The CONTRACTOR shall arrange the disposal site outside at his own cost.
- 21.69 The Construction CONTRACTOR shall make his own surveying arrangements for locating the coordinates and positions of all work and establishing the reduced levels (RL's) at these locations based on two reference grid lines and one bench mark which will be furnished by the MRPL. The CONTRACTOR has to provide at site all the required survey instruments, along with qualified





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surveyors, to the satisfaction of the PMC/ MRPL so that the work can be carried out accurately and according to the specification and drawings.



- 21.70 Excavation shall include removal of trees including roots & organic remains, vegetation, grass, bushes, shrubs, plants, poles, fences etc. that are in the area to be excavated as well as beyond the excavation line so as to ensure safety of the excavated side slopes and of men and equipment operating in the area. Before start of excavation work, joint measurements of ground level shall be taken after clearing all grass, vegetation etc.
- 21.71 Excavation shall include the removal of all materials required to execute the work properly and shall be made with sufficient clearance as decided by the PMC/ MRPL to permit the placing and setting of forms, inspection and completion of all works to the satisfaction of the PMC for which the excavation was done.
- 21.72 RCC pavement with screeding (including smooth finishing) shall be provided inside Pump House/ Pump Station and any other areas as detailed in tender document elsewhere.
- 21.73 Contractor to adhere to work under permit system specified elsewhere in the tender documents.

#### **18. REFERENCE DOCUMENTS FOR ENGINEERING STANDARD SPECIFICATION, DESIGN BASIS AND STANDARD DRAWINGS.**



Sl. No.	Document No.	Title
1.	750-20005-P-PID-1060_Sht 1 of 2	PIPING AND INSTRUMENTATION DIAGRAM LEGEND
2.	750-20005-P-PID-1060_Sht 2 of 2	PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET FOR PFD AND P&ID
3.	750-20005-P-PID-1061	PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7037B AND PUMPS GA-70009B/75001
4.	750-20005-P-PID-1062	PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7004 C/D
5.	750-20005-P-PID-1063	PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7004F
6.	750-20005-P-PID-1064	PIPING AND INSTRUMENTATION DIAGRAM FOR LUBRICITY DOSING SYSTEM AND PCK CIRCULATION PUMP
7.	750-20005-P-PID-1065_Sht 1 of 2	PIPING AND INSTRUMENTATION DIAGRAM FOR BOOSTER PUMPS AND METERING
8.	750-20005-P-PID-1065_Sht 2 of 2	PIPING AND INSTRUMENTATION DIAGRAM FOR BOOSTER
9.	750-20005-GEN-E-SH-5003	ELECTRICAL LOAD LIST
10.	750-20005-GEN-E-SCH-5001	ELECTRICAL CABLE SCHEDULE
11.	750-20005-GEN-E-SH-5001	ELECTRICAL EQUIPMENT LIST
12.	750-20005-GEN-E-DWG-5000	ELECTRICAL EQUIPMENT EARTHING LAYOUT SUB
13.	16A11-DWG-E-0118_Rev5	SINGLE LINE DIAGRAM OF S/S-24 (PHASE-II)
14.	16A11-DWG-E-0120_R5	SINGLE LINE DIAGRAM OF S/S-25 (PHASE-II)
15.	1650-001	MAIN SINGLE LINE DIAGRAM
16.	1650_0412	EQUIPMENT AND CABLE TRENCH LAYOUT SUBSTATION - S/S:24)
17.	1650-0413	EQUIPMENT LAYOUT SUBSTATION 25 (FOR P/L TERMINAL)

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Sl. No.	Document No.	Title
18.	1650-0401	EQUIPMENT LAYOUT-PMHBL
19.	750-20005-GEN-E-DW-0001	CABLE ROUTING LAYOUT MARKUP
20.	750-20005-GEN-E-DW-0002	CABLE ROUTING LAYOUT MARKUP
21.	750-20005-GEN-E-DW-0003	CABLE ROUTING LAYOUT MARKUP-PMHBL
22.	750-20005-GEN-E-DW-5002	STANDARD INSTALLATION DRAWING
23.	750-20005-GEN-E-SPE-5004	STANDARD SPECIFICATION FOR NUMERICAL RELAYS
24.	750-20005-GEN-E-SPE-5001	STANDARD SPECIFICATION FOR SWITCHBOARD
25.	20005-GEN-E-SPE-5011	STANDARD SPECIFICATION FOR ELECTRICAL EQUIPMENT INSTALLATION
26.	20005-GEN-E-SPE-5012	STANDARD SPECIFICATION FOR CABLE
27.	20005-GEN-E-SPE-5013	STANDARD SPECIFICATION FOR EARTHING INSTALLATION
28.	20005-GEN-E-SPE-5014	STANDARD SPECIFICATION FOR MEDIUM AND HIGH
29.	750-20005-GEN-E-IRT-5005	INSPECTION REQUIREMENT TABLE
30.	750-20005-GEN-E-SPE-5005	SPECIFICATION FOR SWITCHGEAR MODIFICATION
31.	750-20005-GEN-E-DS-5002	DATA SHEET FOR CABLE
32.	750-20005-GEN-E-DS-5001	DATA SHEET FOR SWITCHBOARDS
33.	750-20005-GEN-L-DW-0001	PIPING PLAN NEAR TANKS FB-7037 & FB-7037B
34.	750-20005-GEN-L-DW-0002	PIPING PLAN NEAR WHITE OIL PUMP HOUSE
35.	750-20005-GEN-L-DW-0003	PIPING PLAN NEAR TANK FB-7005A
36.	750-20005-GEN-L-DW-0004	PIPING PLAN NEAR TANK FB-7004A
37.	750-20005-GEN-L-DW-0005	PIPING PLAN NEAR TANK FB-7004C & FB-7004D
38.	750-20005-GEN-L-DW-0006	PIPING PLAN NEAR TANK FB-7004C
39.	750-20005-GEN-L-DW-0007	PIPING PLAN NEAR TANK FB-7004F
40.	750-20005-GEN-L-DW-0008	PIPING PLAN FOR PUMP HOUSE III
41.	750-20005-GEN-L-DW-0009	PIPING PLAN NEAR TANK FB-7005D
42.	750-20005-GEN-L-DW-0010	PIPING PLAN NEAR TANK FB-7005 E&F
43.	750-20005-GEN-L-DW-0011	PIPING PLAN NEAR BLENDING STATION

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Sl. No.	Document No.	Title
44.	750-20005-GEN-L-DW-0012	PIPING PLAN NEAR TANK FB-7005L & PH-33
45.	750-20005-GEN-L-DW-0013	PIPING PLAN FOR 28" MBPL LINE NEAR MRPL/HPCL BOUNDARY LIMIT
46.	750-20005-GEN-L-DW-0014	MBPL ATF SUCTION LINE MODIFICATION FOR TRANSFER OF ATF FROM MRPL TO
47.	750-20005-GEN-S-DW-2301	GENERAL NOTES FOR ARCHITECTURAL AND CONCRETE WORKS
48.	750-20005-GEN-S-DW-2302	GENERAL NOTES FOR STRUCTURAL STEEL WORKS
49.	750-20005-GEN-S-DW-2303	STANDARD DETAILS FOR STRUCTURAL STEEL WORKS BEAM CONNECTIONS AND WELDING
50.	750-20005-GEN-S-DW-2304	STANDARD DETAILS FOR FIXING GRATINGS AND CHEQUERED PLATES
51.	750-20005-GEN-S-DW-2305	STANDARD DETAILS FOR R.C.C / RIGID
52.	750-20005-GEN-E-SH-5003	ELECTRICAL LOAD LIST
53.	750-20005-GEN-E-SCH-5001	ELECTRICAL CABLE SCHEDULE
54.	750-20005-GEN-E-SH-5001	ELECTRICAL EQUIPMENT LIST
55.	750-20005-GEN-E-DWG-5000	ELECTRICAL EQUIPMENT EARTHING LAYOUT SUB STATION-25
56.	16A11-DWG-E-0118_Rev5	SINGLE LINE DIAGRAM OF S/S-24 (PHASE-II)
57.	16A11-DWG-E-0120_R5	SINGLE LINE DIAGRAM OF S/S-25 (PHASE-II)
58.	1650-001	MAIN SINGLE LINE DIAGRAM
59.	1650_0412	EQUIPMENT AND CABLE TRENCH LAYOUT SUBSTATION - S/S:24)
60.	1650-0413	EQUIPMENT LAYOUT SUBSTATION 25 (FOR P/L TERMINAL)
61.	1650-0401	EQUIPMENT LAYOUT-PMHBL
62.	750-20005-GEN-E-DW-0001	CABLE ROUTING LAYOUT MARKUP
63.	750-20005-GEN-E-DW-0002	CABLE ROUTING LAYOUT MARKUP
64.	750-20005-GEN-E-DW-0003	CABLE ROUTING LAYOUT MARKUP-PMHBL
65.	750-20005-GEN-E-DW-5002	STANDARD INSTALLATION DRAWING
66.	750-20005-GEN-E-SPE-5004	STANDARD SPECIFICATION FOR NUMERICAL
67.	750-20005-GEN-E-SPE-5001	STANDARD SPECIFICATION FOR SWITCHBOARD
68.	20005-GEN-E-SPE-5011	STANDARD SPECIFICATION FOR ELECTRICAL EQUIPMENT INSTALLATION
69.	20005-GEN-E-SPE-5012	STANDARD SPECIFICATION FOR CABLE INSTALLATION
70.	20005-GEN-E-SPE-5013	STANDARD SPECIFICATION FOR EARTHING
71.	20005-GEN-E-SPE-5014	STANDARD SPECIFICATION FOR MEDIUM AND HIGH VOLTAGE CABLES & ACCESSORIES
72.	750-20005-GEN-E-IRT-5005	INSPECTION REQUIREMENT TABLE
73.	750-20005-GEN-E-SPE-5005	SPECIFICATION FOR SWITCHGEAR

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Sl. No.	Document No.	Title
74.	750-20005-GEN-E-DS-5002	DATA SHEET FOR CABLE
75.	750-20005-GEN-E-DS-5001	DATA SHEET FOR SWITCHBOARDS

## 19. ABBREVIATIONS

A	Ampere
AERB	Atomic Energy Regulatory Board
AFC	Approved For Construction
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
AMCA	Air Movement and Control Association International
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ATF	Aviation Turbine Fuel
BARC	Bhabha Atomic Research Centre
MESCOM	Mangalore Electricity Supply MRPL Limited
BIS	Bureau of Indian Standard
BS	British Standard
CCE	Chief Controller of Explosives
CEA	Central Electrical Authority
CEIG	Chief Electrical Inspector General
CPCB	Central Pollution Control Board
CPWD	Central Public Works Department
DGCA	Directorate General of Civil Aviation
DGMS	Director General Mine's safety
DOL	Direct On Line
DP	Dye Penetrant
EPC	Engineering Procurement Construction
EPCC	Engineering, Procurement, Construction & Commissioning
GAD	General Arrangement Drawing
GI	Galvanized Iron
HSD	High Speed Diesel
IBR	Indian Boilers Regulations
IEC	International Electro technical Commission
IEEE	Institute of Electrical and Electronics Engineers
IS	Indian Standards
ISO	International Standard Organization
ITP	Inspection and Test Plan
LPCB	Loss Prevention Certification Board
CONSTRUCTION	Lump sum Turn Key
LPG	Liquefied Petroleum Gas

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LV	Low Voltage
MEL	Main Earth Loop
MRPL	Mangalore Refinery and Petrochemicals Limited
MTO	Material Take Off
NB	Nominal Bore
NDT	Non-Destructive Test
NFPA	National Fire Protection Association
OEM	Original Equipment Manufacturers
OISD	Oil Industry Safety Directorate
O&M	Operation and Maintenance
PESO	Petroleum and Explosives Safety Organization
POL	Petroleum, Oil, and Lubricants
PMC	Project Management Consultant
PMHBL	Petronet MHB Limited
PQR	Procedure Qualification Records
PWD	Public Works Department
QAP	Quality Assurance Plan
QA/QC	Quality Assurance / Quality Control
RCC	Reinforced Cement Concrete
SLD	Single Line Diagram
TAC	Tariff Advisory Committee
TPIA	Third Party Inspection Agency
TPI	Third Party Inspector
V	Volt
VDRL	Vendor Data Requirement List
WHO	World Health Organization
ATEX	Atmosphere explosive
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
AHU	Air Handling Unit
CFC	Chlorofluorocarbons
DAS	Data Acquisition system
DW	Duct Work
EN	European Norm
F&G	Fire and Gas
HVAC	Heat, Ventilation and Air Conditioning
HCFC	Hydro chlorofluorocarbons
ISA	International Society for Automation
MERV	Minimum Efficiency Reporting Value
PLC	Programmable logic controller
SMACNA	Sheet Metal and Air Conditioning CONTRACTORs National Association

	<b>Tender for Construction works within MRPL Refinery at Mangalore Marketing Infrastructure Projects, MRPL</b>		Page 789 of 1115		
	Part - C	<b>PACKAGE - D SCOPE OF WORK (BROWN FIELD) FOR REFINERY &amp; PMHBL MODIFICATION</b>	Tender No:		3200000590
	Section - C-1		Document No:		20005-GEN-PME-SOW-1000
Subsection - C-1.1	Rev:		0		

SIL	Safety integrity level
VFD	Variable Frequency Drive

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# CONSTRUCTION TENDER

A	IFR	10-June-2022	ISSUED FOR REVIEW/COMMENTS	KSR	SDK	ASN	
Revision	Status	Date	Description	Prepared	Checked	Approved	MRPL
Client	 <b>MANGALORE REFINERY AND PETROCHEMICAL LIMITED</b>						
Eng. Partner	 <b>NAUVATA ENGINEERING PVT LTD</b>						
Project	<b>TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES</b>						
Document Title	<b>CONSTRUCTION TENDER</b>				Location:	<b>MANGALORE</b>	
Scale	Project Code:	Tender No.: -		Document No.:		Sheet No.:	
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**1) COLD TAPPING (FB-7037B TANK HEADER EXTENDED WITH NEW MANIFOLD): (CT-01)**(East of tank FB-7037B)

**Activity:** Tank FB-7037B (PCA storage tank), the existing manifold header line 16"-P-4703457M-A1A is being extended (CT-01) with a new line no. 16"-P-7500016-A1A, so as to incorporate new 14", 6", 4" & 8" branch as below.

- New branch line 14"-P-7500001-A1A taken from the extended header line is being routed from the new 16" manifold header up to the existing pumps GA-7004A/B (HT-06).
- New branch line 6"-P-7500003-A1A taken from the extended header line to be routed up to the tank FB-7004C.
- New branch line 8" spare line.
- New branch line for PSV-750012 (PSV: Outlet line number 4"-P-7500088-A1A & Inlet line number 3"-P-7500087-A1A) routed & connected.

Refer P&amp;ID Number : 750-20005-P-PID-1061.



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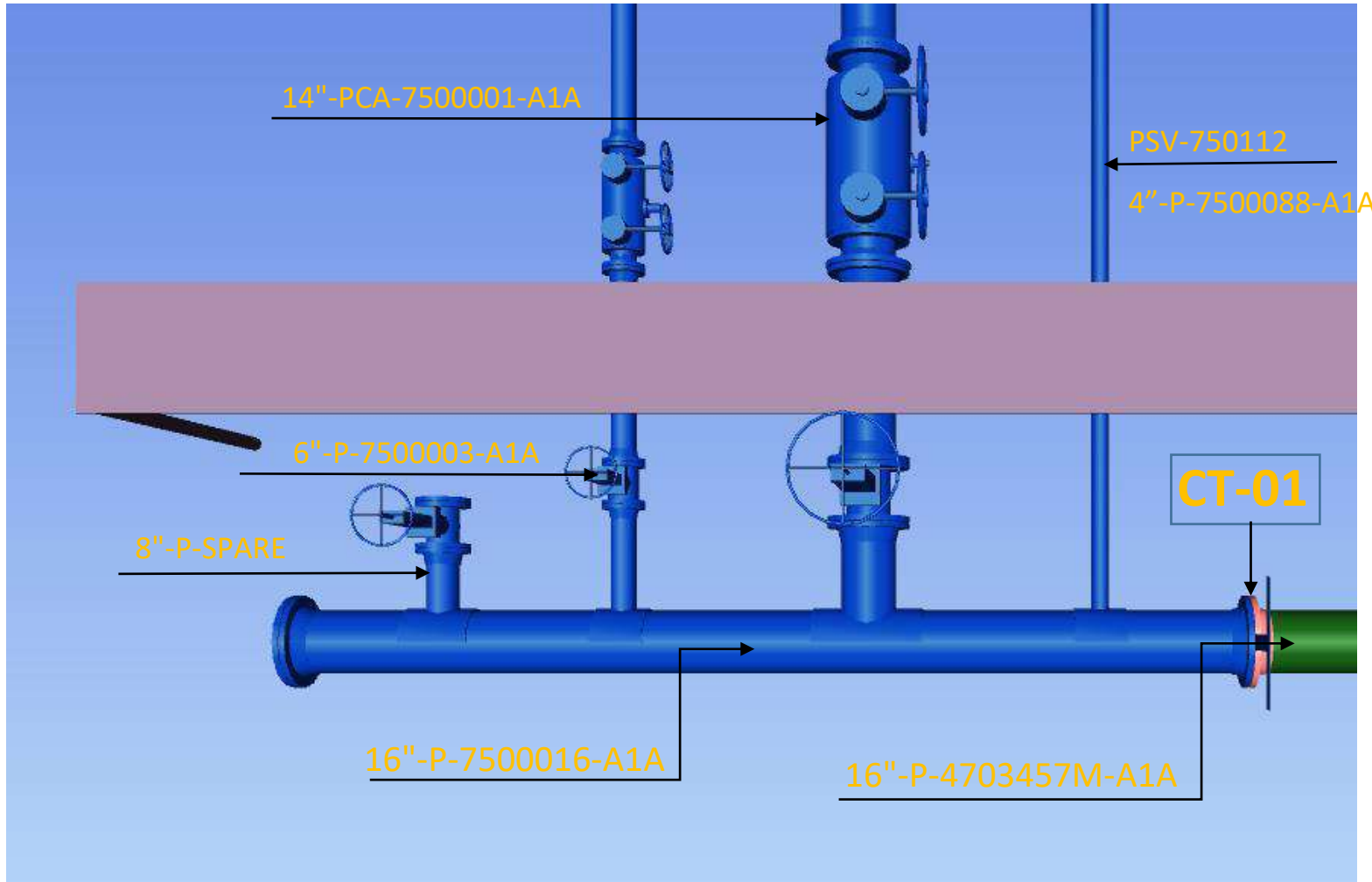
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2) **HOT JOINT (Existing 16" line Modification to add DBBV-750102): (HJ-27A, HJ-27B)** (EAST SIDE OF TANK FB-7037B)

**Activity:** Existing line number 16"-P-4703457M-A1A to be modified by installing New DBB Valve (DBBV-750102) as marked in below snap by Hot joint (HJ-27A, HJ-27B). Refer P&ID Number : 750-20005-P-PID-1061.



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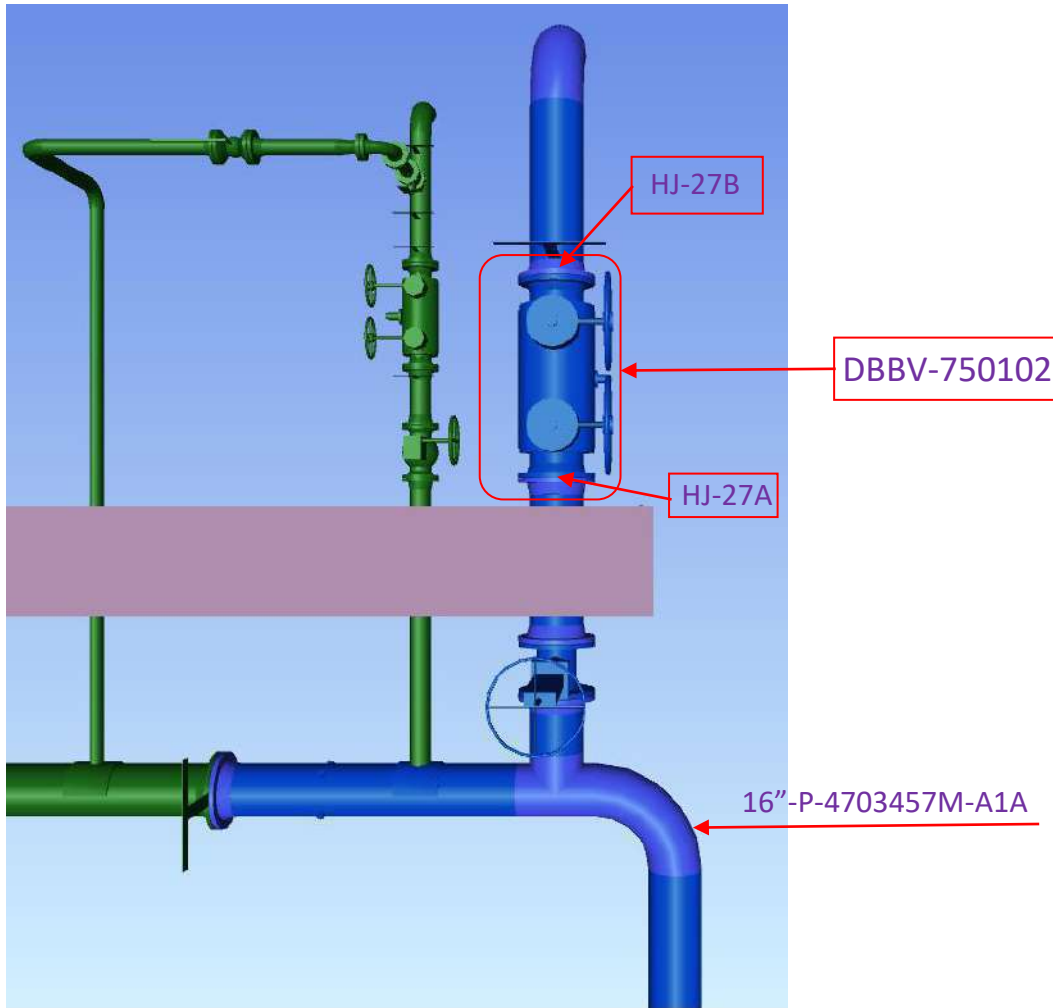
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3) **HOT JOINT (PSV-750112 ADDED TO EXISTING LINE): (HJ-18)** (East of FB-7037B TANK)

**Activity:** In existing 6" Xylo Rundown Line new PSV-750112 line 3"-P-7500087-A1A to be branched (Hot Joint) as marked below. Refer P&ID Number : 750-20005-P-PID-1061.



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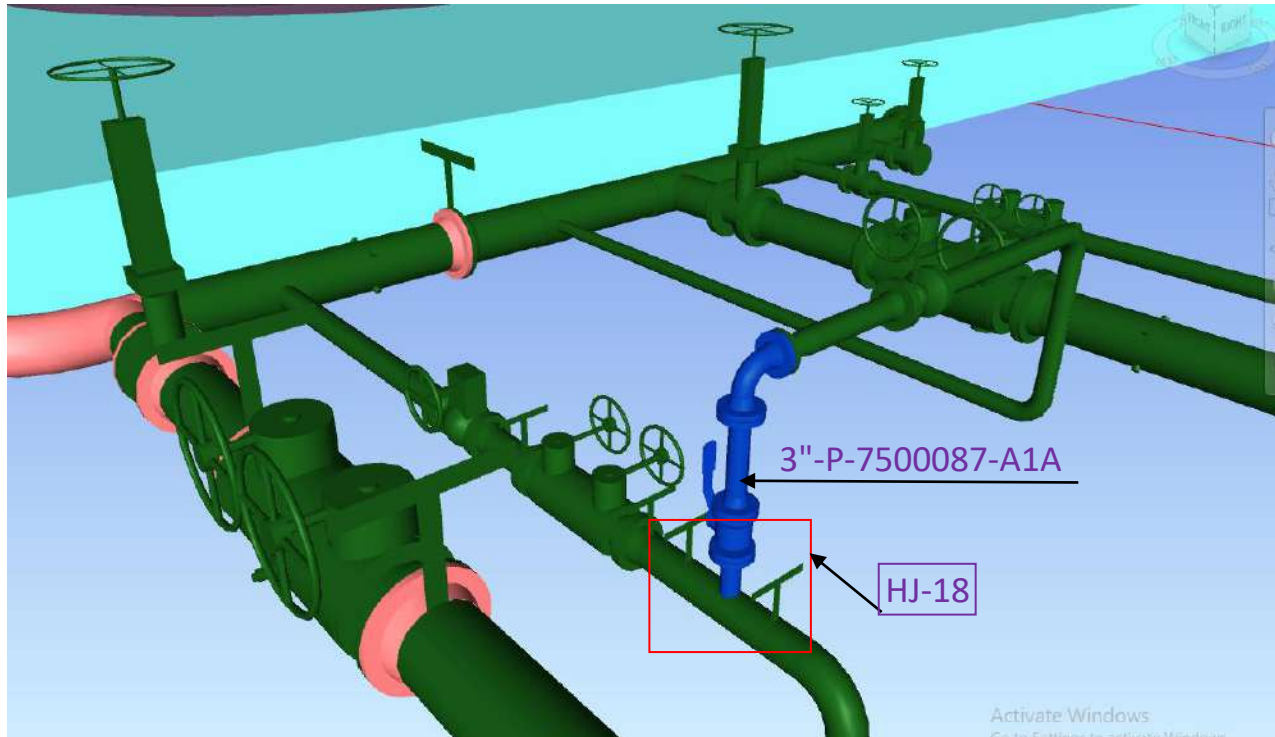
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4) **HOT JOINT (HJ-02A, HJ-02B) (Existing 6" line Modification to add DBBV-750104):** (East of FB-7037B TANK)

**Activity:** The existing 6" Xylo rundown line to be modified to install new DBB Valve (DBBV-750104) by Hot Joint (HJ-02A/ HJ-02B). Refer P&ID Number : 750-20005-P-PID-1061.





Title : CONSTRUCTION TENDER

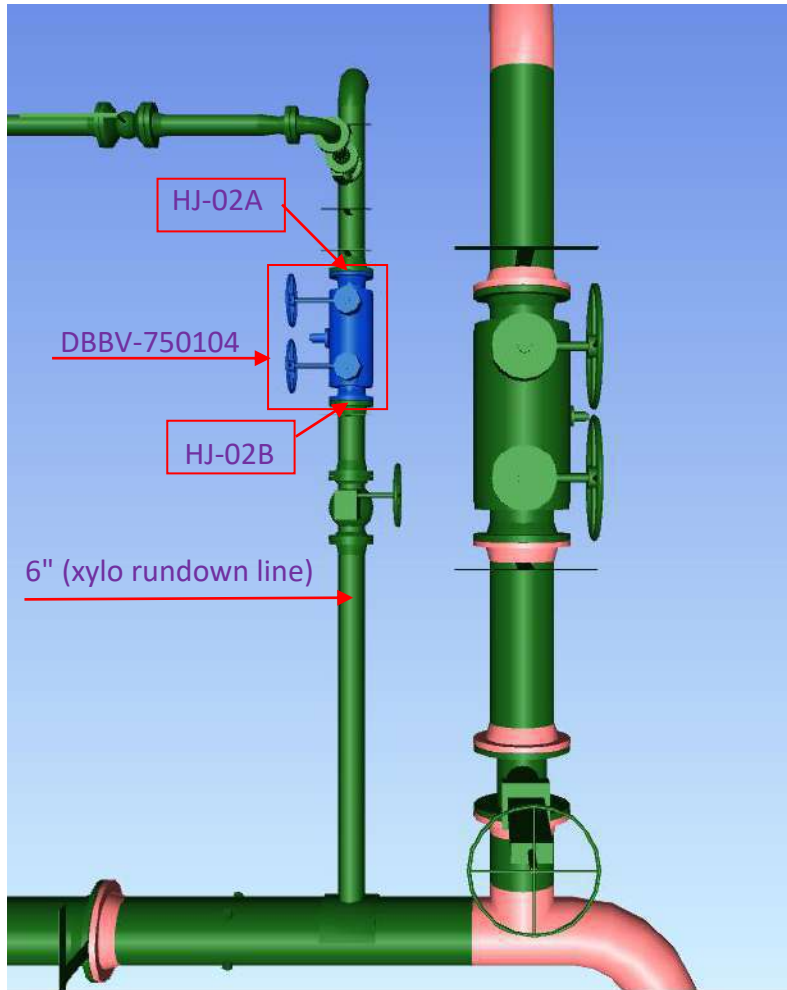
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5) **HOT TAPPING : (HT-02A, HT-02B) (NEAR PUMP HOUSE 33 / FB-7005L TANK)**

**Activity:**

From existing header (DHDT UNIT) line number 6"-P-3781045-B1A, new Hot tapping (HT-02A, HT-02B) line number 6"-P-7500002-B1A/A1A & routed along pipe racks to connect with new line number 6"-P-7500004-A1A near manifold of FB-7004C. Refer P&ID Number : 750-20005-P-PID-1061 & 750-20005-P-PID-1062.



Title : CONSTRUCTION TENDER

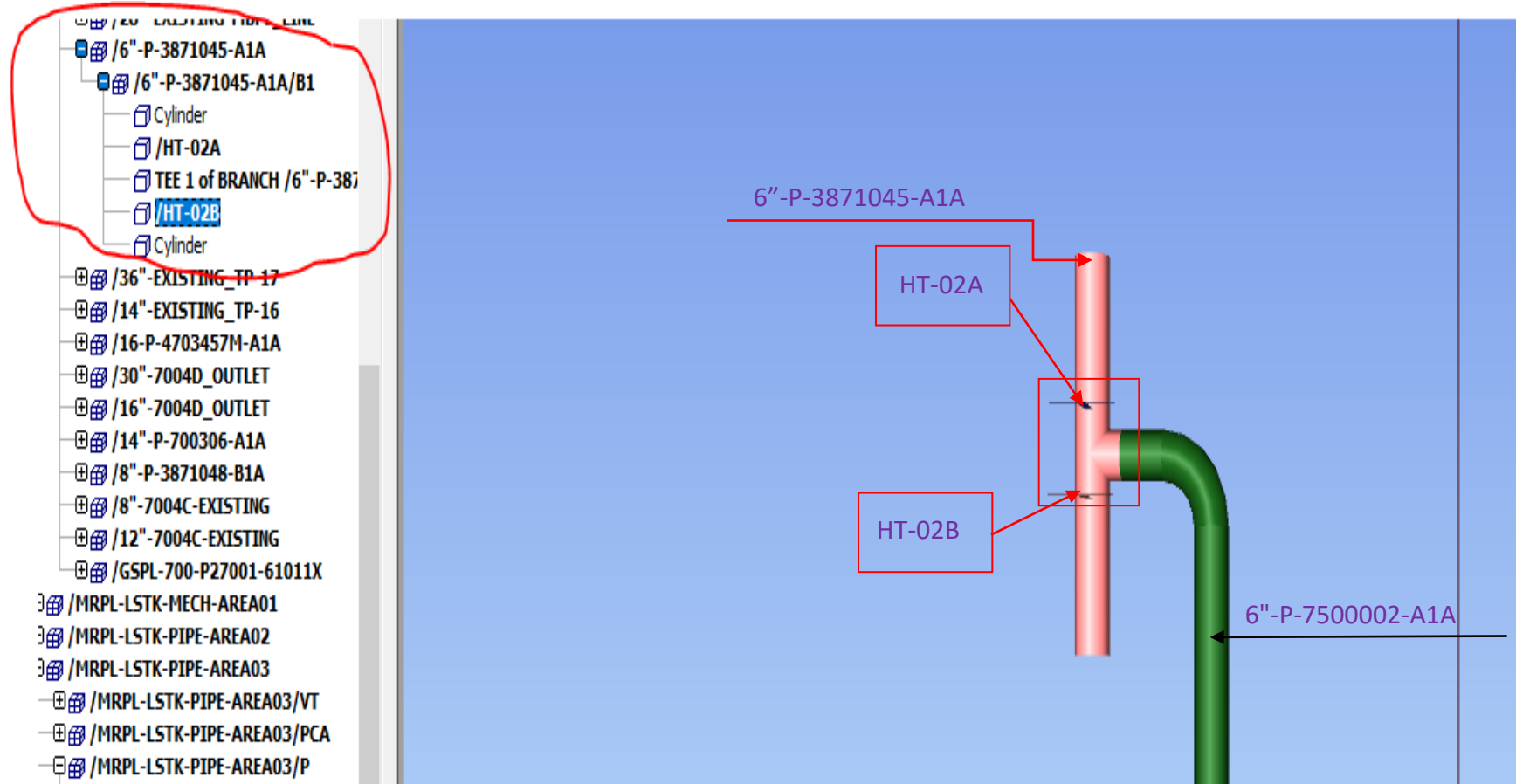
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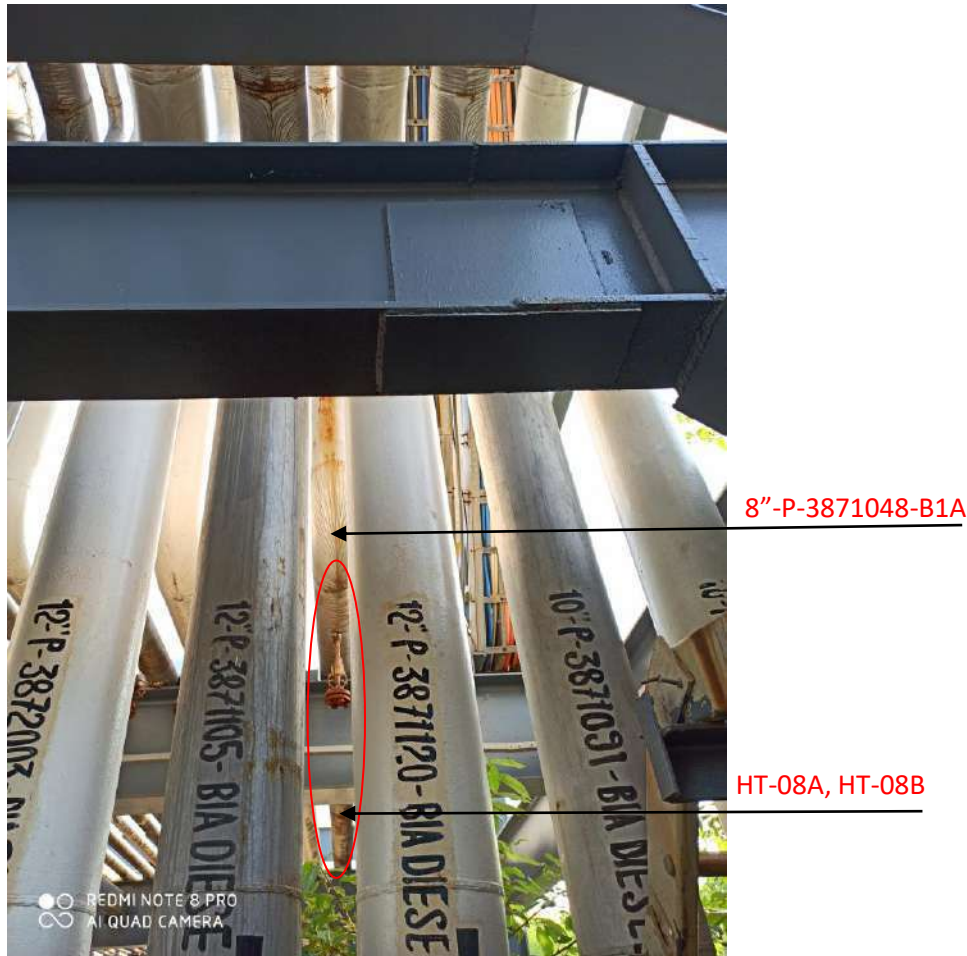
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6) HOT JOINT: (HT-08A, HT-08B) (FROM PIPE RACK CLOSE TO FB-7001F TANK)

**Activity:** From existing line number 8"-P-3871048-B1A (HCU-1/2), new line Hot Tapping (HT-08A & HT-08B) to be taken and routed to existing header with Hot Tapping (HJ-01A) (6" Xylo rundown line) Refer P&ID Number : 750-20005-P-PID-1062.



Title : CONSTRUCTION TENDER

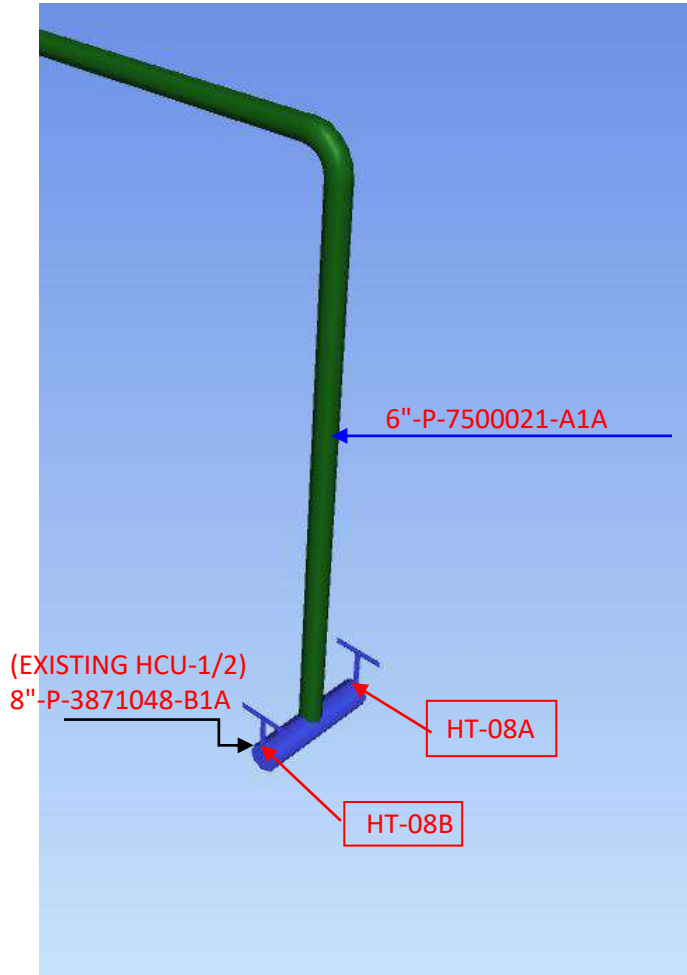
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7) HOT JOINT : (HJ-01A, HJ-01B, HJ-01C, HJ-01D) & (HJ-22, HJ-23) (NEAR FB-7003I TANK)

**Activity:** Existing line to be modified by cutting vertical raising line near to elbow & to modify elbow by turning (by cutting & welding) towards south side of Tank 7003I then it will be re-connected to existing line to FB-7003G by Hot Joint (HJ-01A) and also existing header is modified by removing existing elbow & provided with flanges & blind flanges & further below line is modified and provide new elbow by Hot Joint (HJ-01C) 6"-P-7500021-A1A and connected to new line and routed all along to existing header (8"-P-3871048-A1A) and done with Hot Tapping (HT-08A, HT-08B). TSV new line to be connected on existing line by Hot Joint HJ-22, HJ-23. Refer P&ID Number : 750-20005-P-PID-1061.



HJ-01C (TO MODIFY)

HJ-01B, HJ-01D (TO MODIFY)

HJ-23, HJ-22

HJ-01A (TO MODIFY)

6"-P-7500021-A1A

Title : CONSTRUCTION TENDER

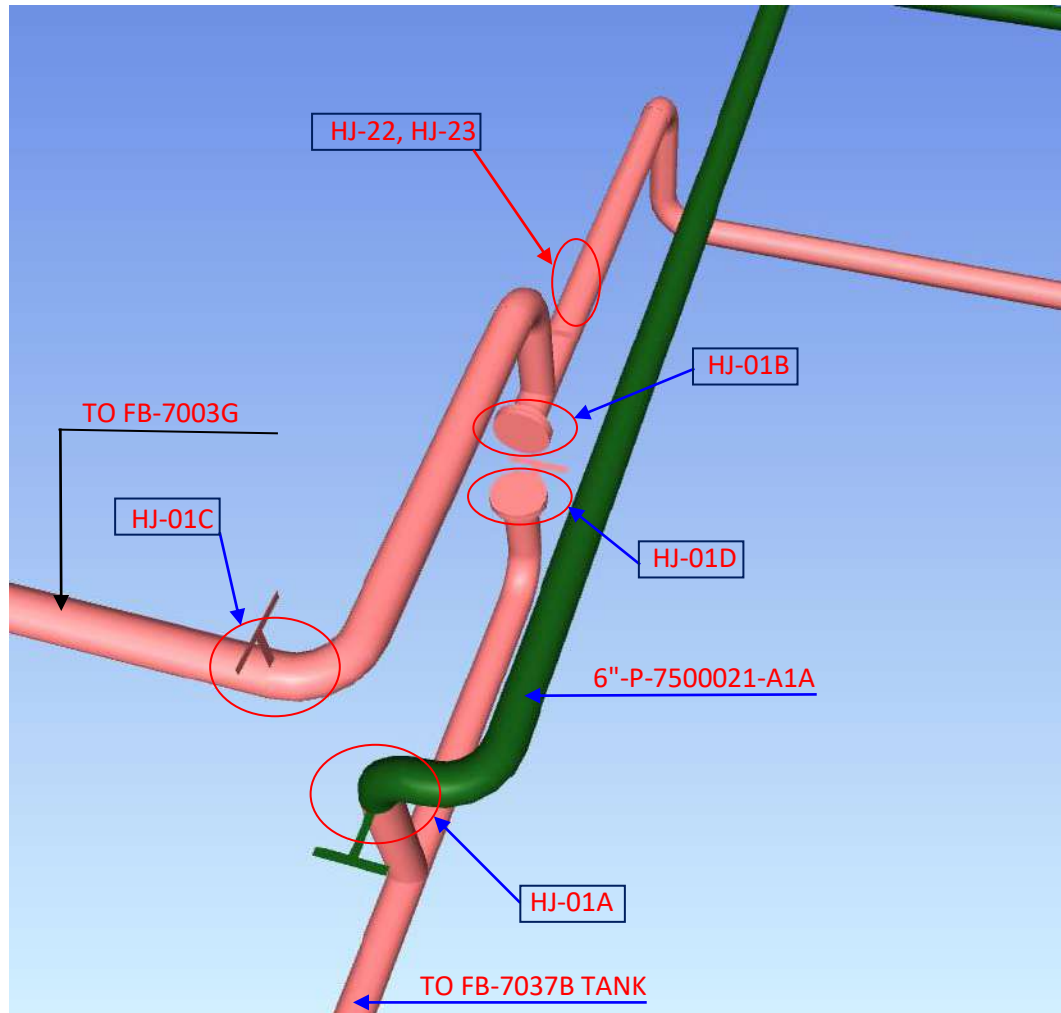
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8) COLD TAPPING: (CT-05A, CT-05B) (NEAR FB-7037 TANK)

**Activity:** Existing 36" outlet line from FB-7037 inline valve to be removed & blinded by cold tapping (CT-05A, CT-05B)

. Refer P&ID Number : 750-20005-P-PID-1061.



FB-7037 TANK OUTLET LINE

CT-05A

CT-05B

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9) COLD TAPPING : (CT-04A, CT-04B) (NEAR FB-7037 TANK)

Activity: Existing 6" Xylo rundown line from FB-7037B Tank to FB-7037 to be isolated by removing Valve by cold tapping (CT-04A & CT-04B). Refer P&ID Number : 750-20005-P-PID-1061.



CT-04A

TO FB-7037 TANK

CT-04B

XYLO RUNDOWN LINE FROM FB-7037B



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### 10) HOT JOINT: (HJ-05A, 05B, 05C)

**Activity:** Existing line from FB-7003G to be isolated (HJ-05C) by removing Tee connecting header line number 36"-P-705302-A1A and blind it other Tee Portion in the main header line shall be removed & made through(Hot joint : HJ-05A, HJ-05B). Refer P&ID Number : 750-20005-P-PID-1061.



HJ-05A, HJ-05B, HJ-05C

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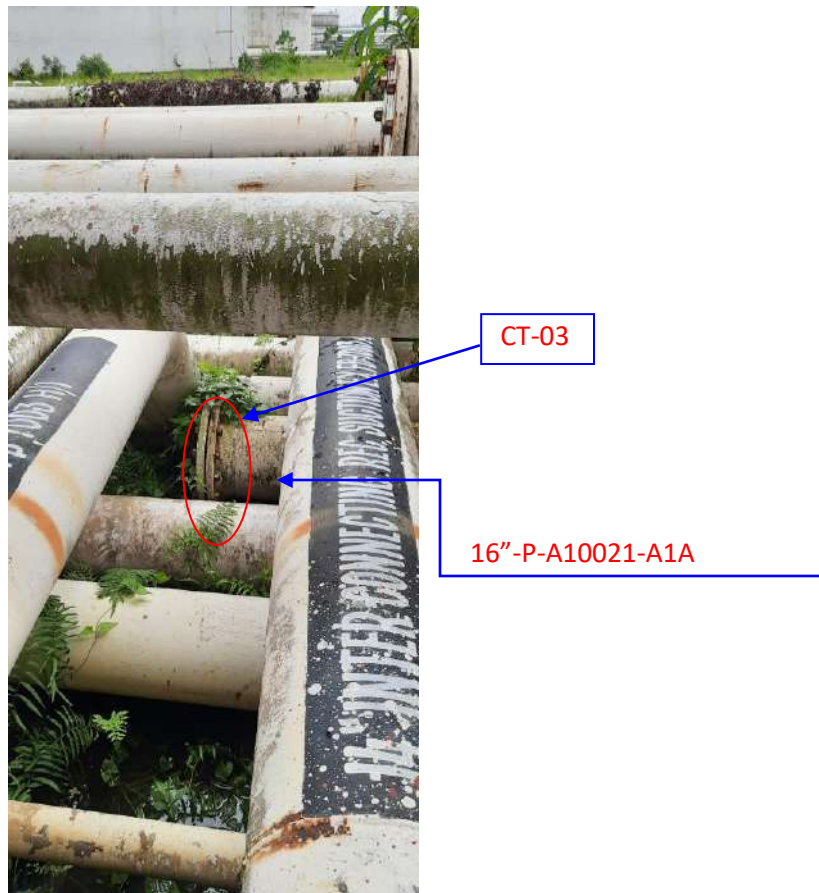
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### 11) COLD TAPPING: (CT-03) (NEAR WHITE OIL PUMP HOUSE SHED)

Activity: Existing Tank FB-7037B (PCA Storage Tank) tank outlet line number 16"-P-4703457M-A1A to be connected with existing Pump GA-7009B & new Pump GA-75001 (16"-P-7500006-A1A) by extending existing suction line by cold tapping (CT-03). Refer P&ID Number : 750-20005-P-PID-1061.



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12) COLD TAPPING: (CT-25, CT-22, CT-21, CT-24, CT-23) (NEAR WHITE OIL PUMP HOUSE SHED)

**Activity:** Existing discharge header 12"-P-A10028-A1A is extended by cold tapping (CT-25) with new line number 12"-P-7500010-A1A & 12" valve to be removed & blinded (CT-21, CT-22) to isolated Existing Pump GA-7009A discharge with another Pump GA-7009B. Refer P&ID Number : 750-20005-P-PID-1061.

CT-25



CT-21, CT-22



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### 13) COLD TAPPING: (CT-24, CT-23) (INSIDE WHITE OIL PUMP HOUSE SHED)

**Activity:** Existing Pump GA-7009B discharge line number 12"-P-A10028-A1A is disconnected & routed to new line number 12"-P-7500010-A1A by Cold tapping (CT-24, CT-23). Refer P&ID Number : 750-20005-P-PID-1061.



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**14) HOT TAPPING: (HT-01A, HT-01B) (NEAR WHITE OIL PUMP HOUSE SHED)**

**Activity:** Existing 16" re-circulation from FB-7037B tank is connected with new line number 16"-P-7500023-A1A by using hot tapping root valve (HJ-01A, HT-01B) and routed from FB-7004C tank manifold header line number 12"-P-7500029-A1A. Refer P&ID Number : 750-20005-P-PID-1061.



HT-01A

HT-01B



Title : CONSTRUCTION TENDER

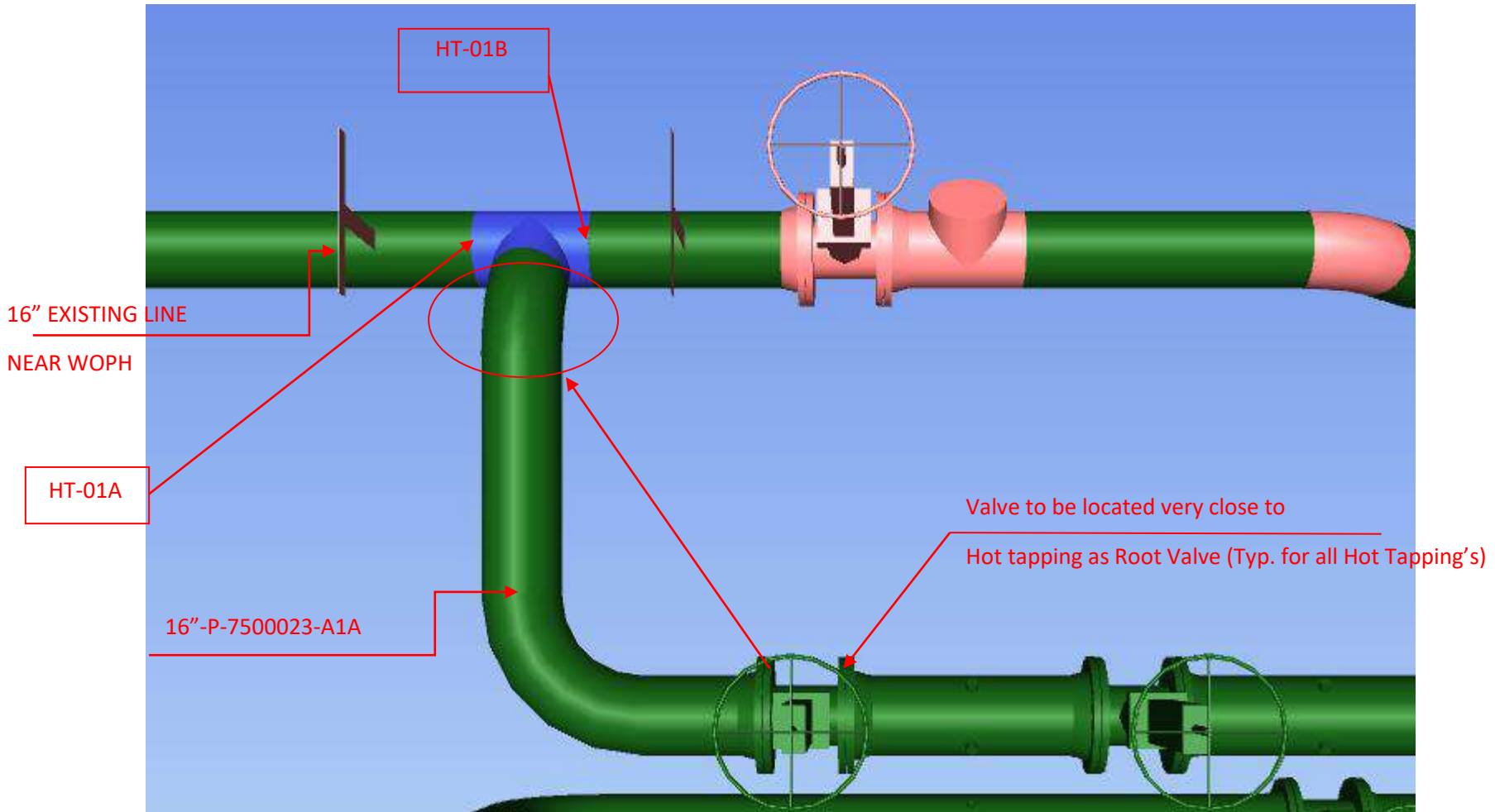
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15) HOT TAPPING: (HT-03A, HT-03B) (NEAR WHITE OIL PUMP HOUSE SHED)

**Activity:** Existing 12” circulation discharge to FB-7037B is connected with new line number 12”-P-7500012-A1A by Hot Tapping (HT-03A, HT-03B) routed to existing tank FB-7004C new manifold line number 12”-P-7500034-A1A. Refer P&ID Number : 750-20005-P-PID-1061.



HT-03A, HT-03B

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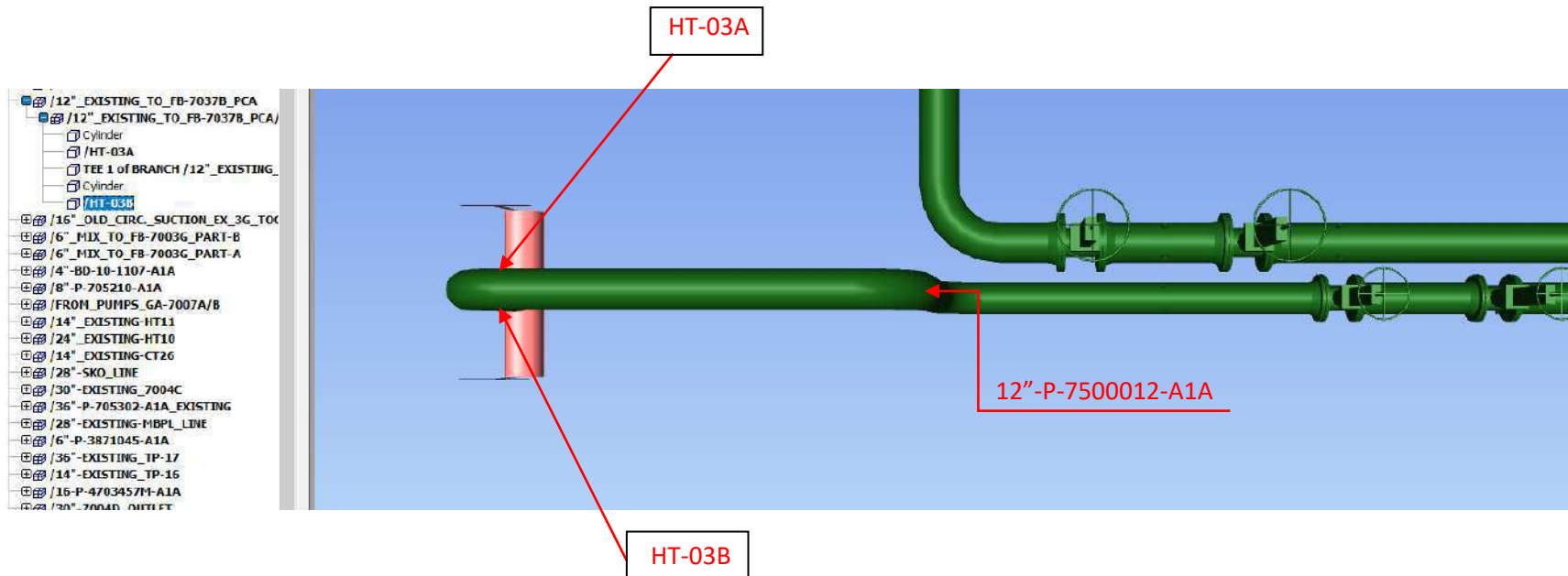
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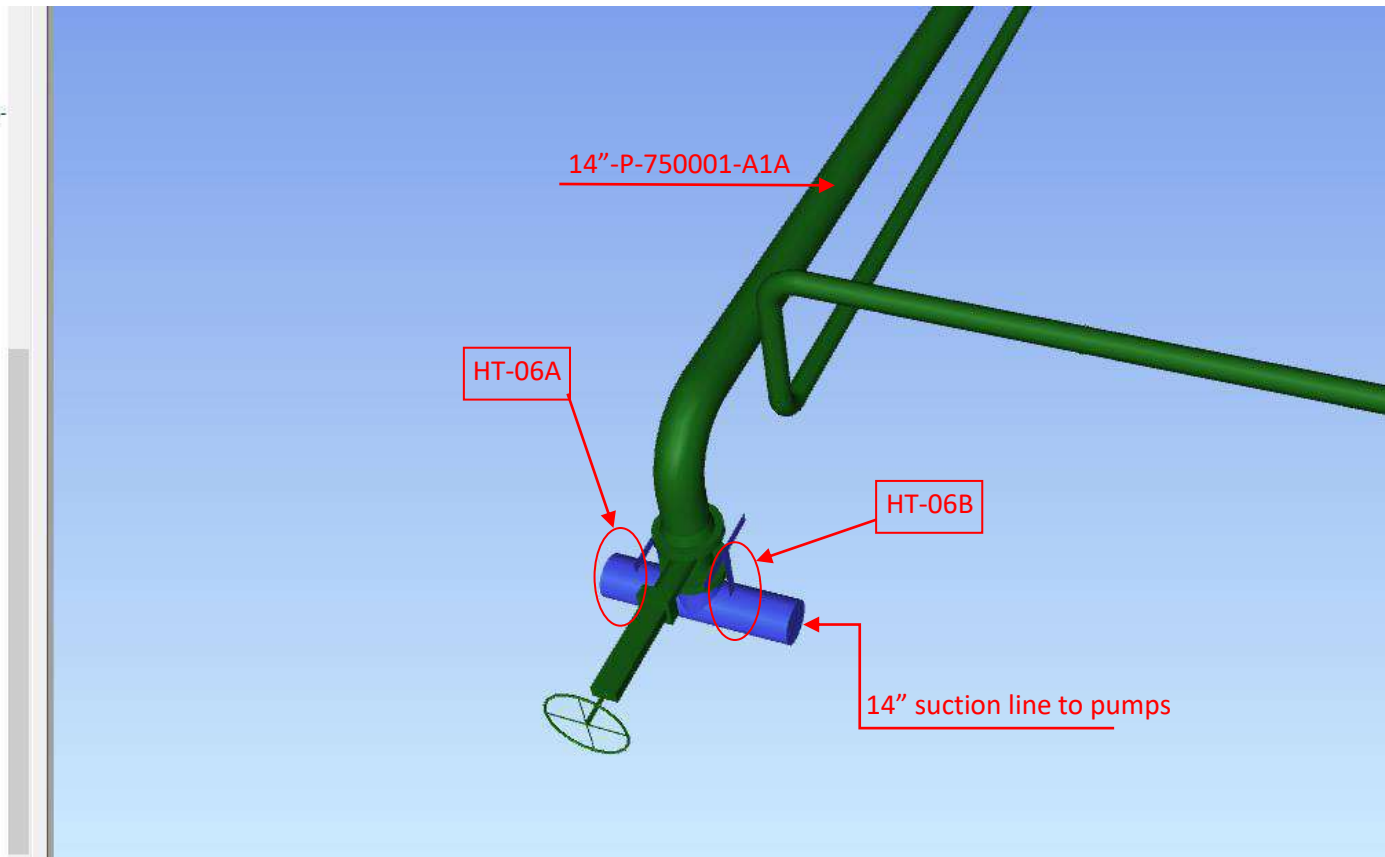
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**16) HOT TAPPING: (HT-06A, HT-06B) (NEAR TO FB-7004C TANK)**

**Activity:** New Line number 14"-P-7500001-A1A routed from FB-7037B tank (PCA Storage Tank, new manifold) and routed to the existing 14" suction line to pumps GA-7004A/B (from FB-7004A/B/E) by Hot tapping (HT-06A, HT-06B). Refer P&ID Number : 750-20005-P-PID-1062.

3D MODEL SNAP:

- [-] /14"-P-700306-A1A
- [-] /14"-P-700306-A1A/B1
  - [ ] Cylinder
  - [ ] /HT-06A
  - [ ] TEE 1 of BRANCH /14"-P-700306-
  - [ ] /HT-06B
  - [ ] Cylinder
- [-] /8"-P-3871048-B1A
- [-] /8"-7004C-EXISTING
- [-] /12"-7004C-EXISTING
- [-] /GSPL-700-P27001-61011X
- | /MRPL-LSTK-MECH-AREA01
- | /MRPL-LSTK-PIPE-AREA02
- | /MRPL-LSTK-PIPE-AREA03
- | /MRPL-LSTK-MECH-AREA03
- | /MRPL-LSTK-SUPP-AREA03
- | /MRPL-LSTK-PIPE-AREA04
- | /MRPL-LSTK-PIPE-AREA05
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- | /REFERENCE\_GRIDS



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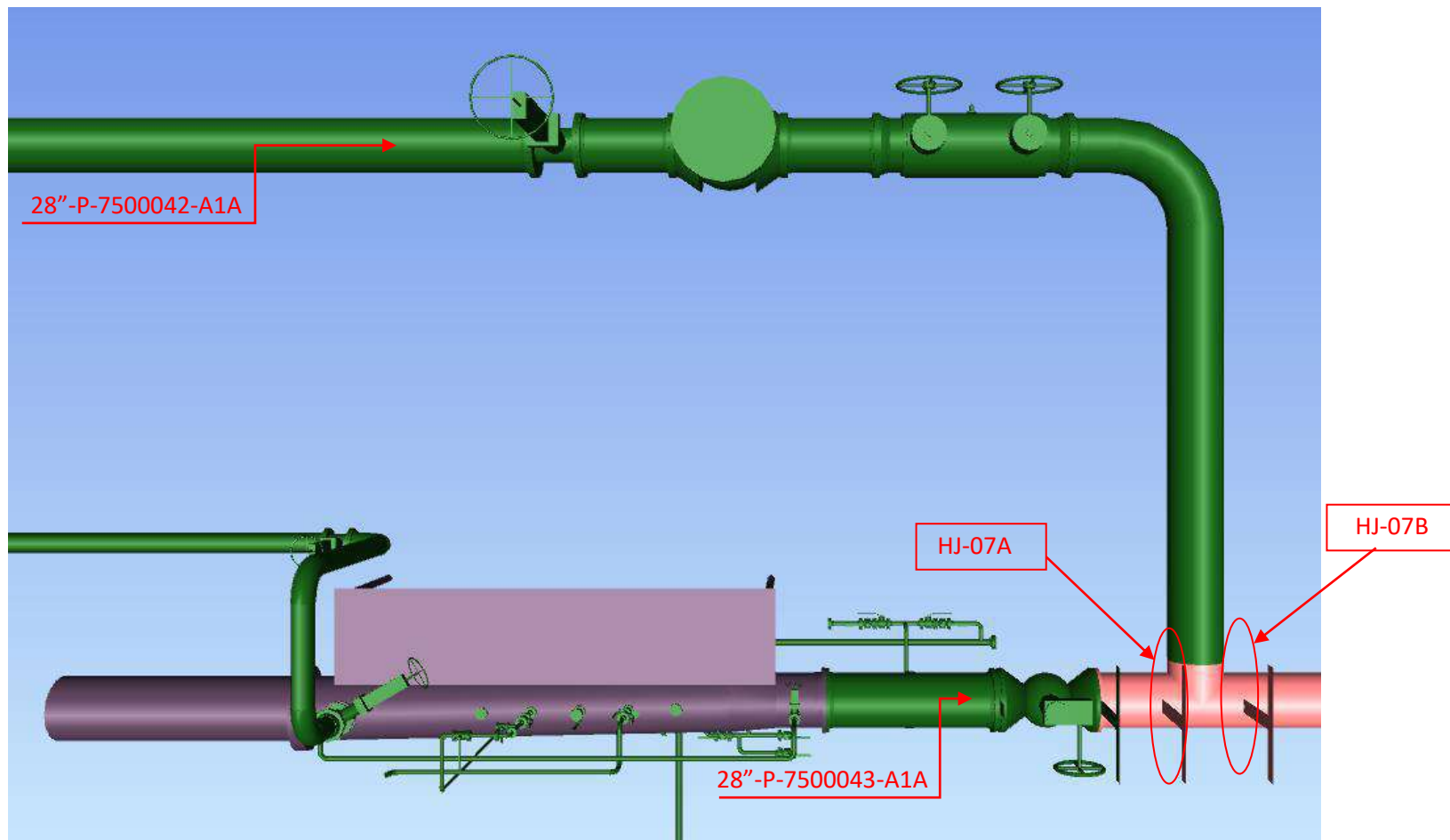
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17) **HOT JOINT: (HJ-07A, HJ-07B) (NEAR FB-7004C TANK)**

**Activity:** New line 28"-P-7500042-A1A taken from existing line 36"-P-705302-A1A by hot tapping to existing header (28" MBPL Line and normal Tee to be replaced with Barred Tee (Hot joint HJ-07A, HJ-07B). Refer P&ID Number : 750-20005-P-PID-1062.



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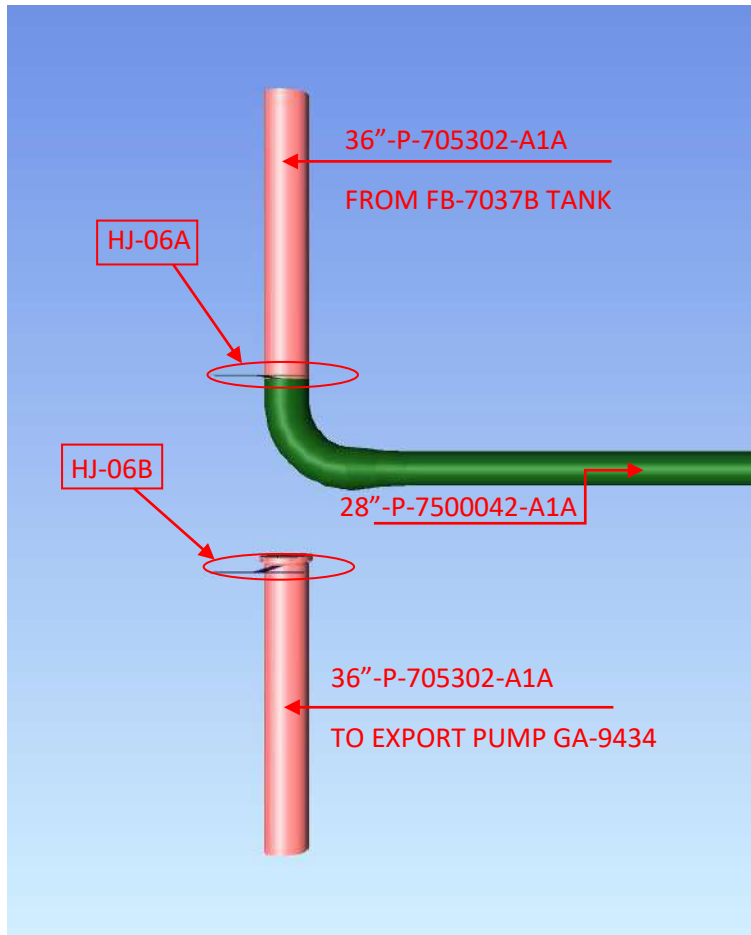
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**18) HOT JOINT: (HJ-06A, HJ-06B) (NEAR FB-7004C TANK)**

**Activity:** Existing line number 36"-P-705302-A1A modified (Hot joint-HT-06B) and connected with new line number 28"-P-7500042-A1A by hot joint (HJ-06A) routed to FB-7004C (New Pig Launcher Location) connecting to modified MBPL line by replacing Tee with Barred tee by hot tapping (HJ-07A. HJ-07B). Refer P&ID Number : 750-20005-P-PID-1062.





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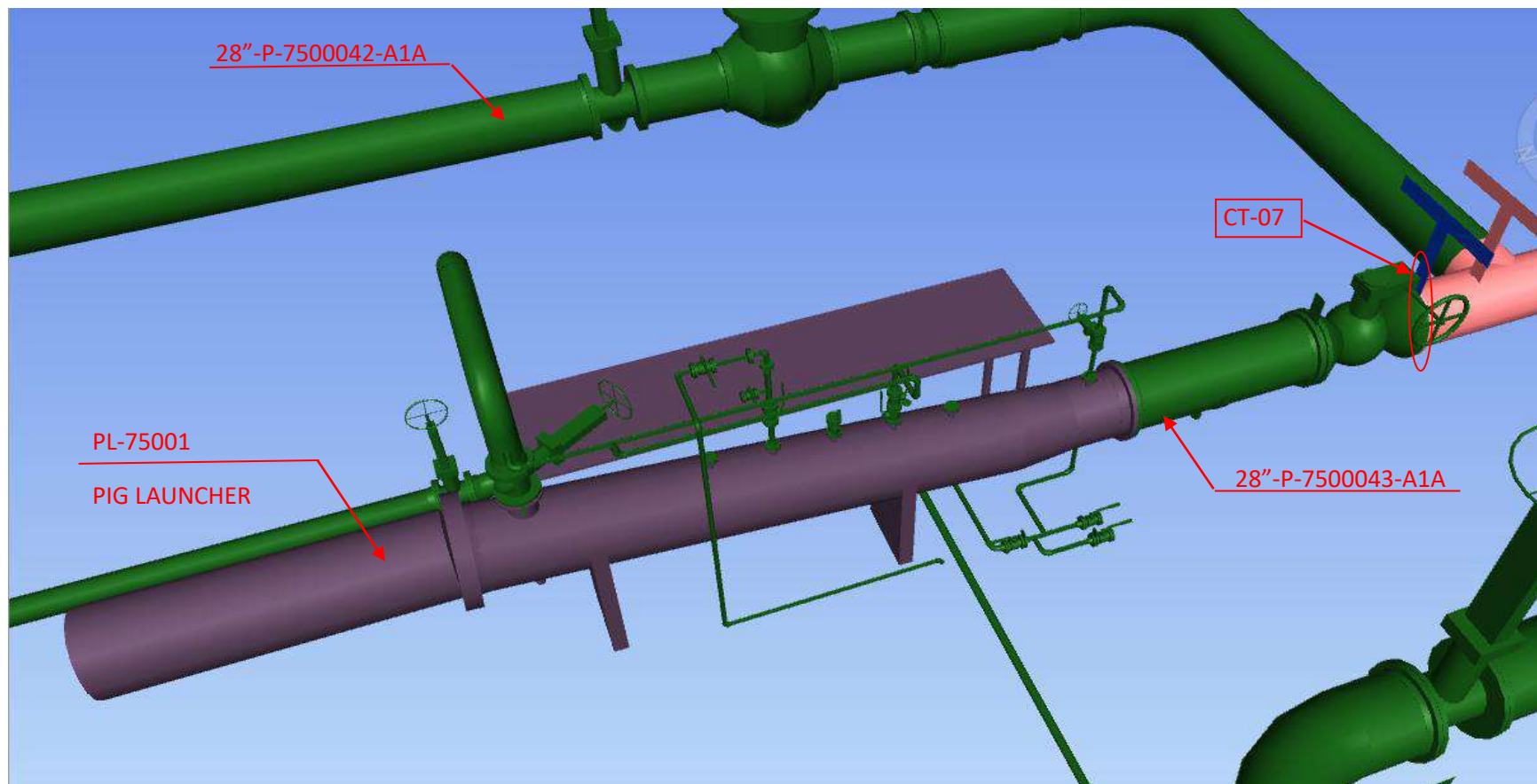
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### 19) COLD TAPPING: (CT-07) (NEAR FB-7004C TANK)

**Activity:** New Pig Launcher with line number 28"-P-7500043-A1A to be located near FB-7004C by modifying existing 28" MBPL line and by providing clearance space for access & operability of Pig Launcher (cold tapping CT-07). Refer P&ID Number : 750-20005-P-PID-1062.





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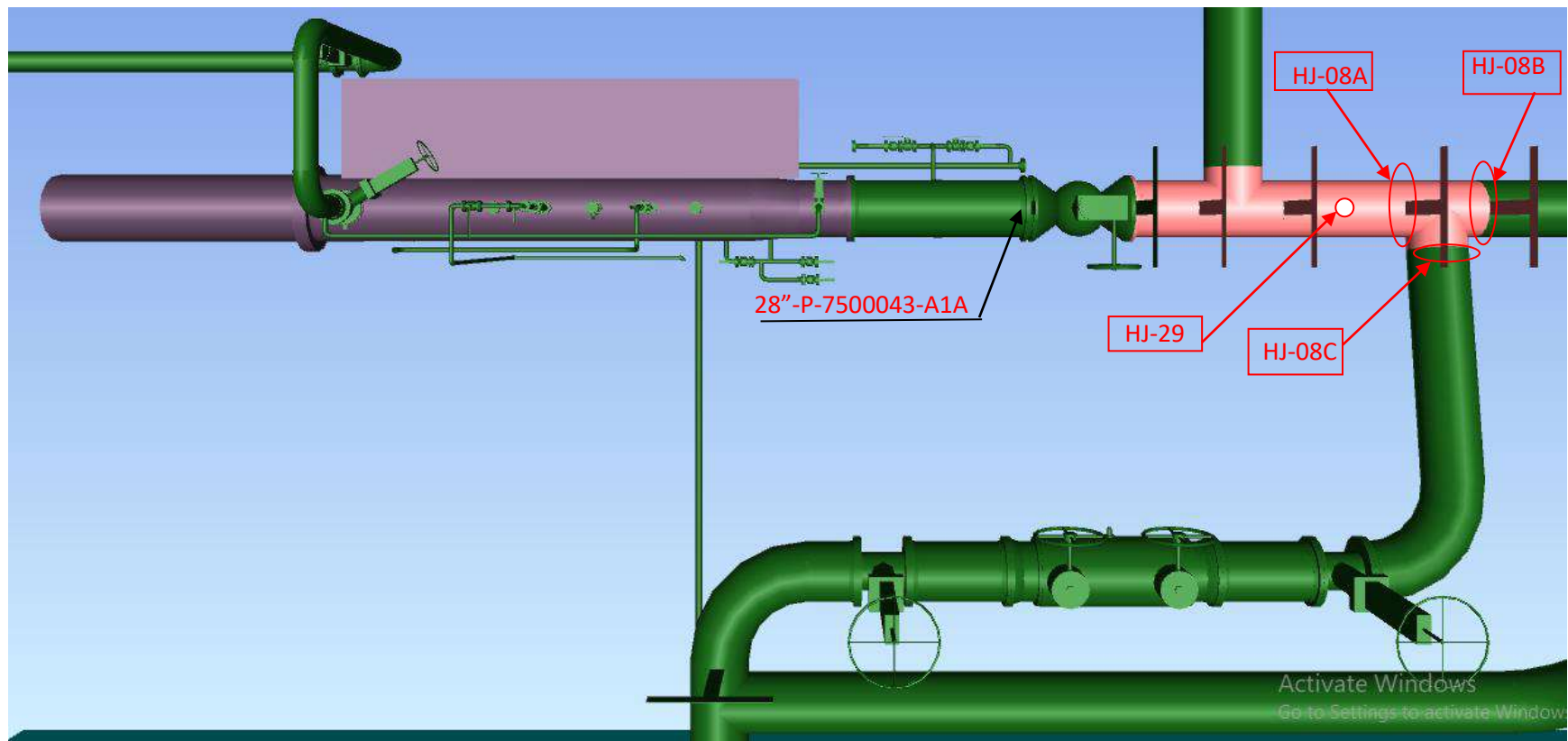
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### 20) HOT JOINT (HJ-08A, HJ-08B, HJ-08C) & (HJ-29) (NEAR FB-7004C TANK)

**Activity:** Existing Tee to be replaced by Barred Tee in 28" MBPL line (Pig Launcher) & also required 2" Hot Joint (HJ-29) for Pig signaler. Refer P&ID Number : 750-20005-P-PID-1062.



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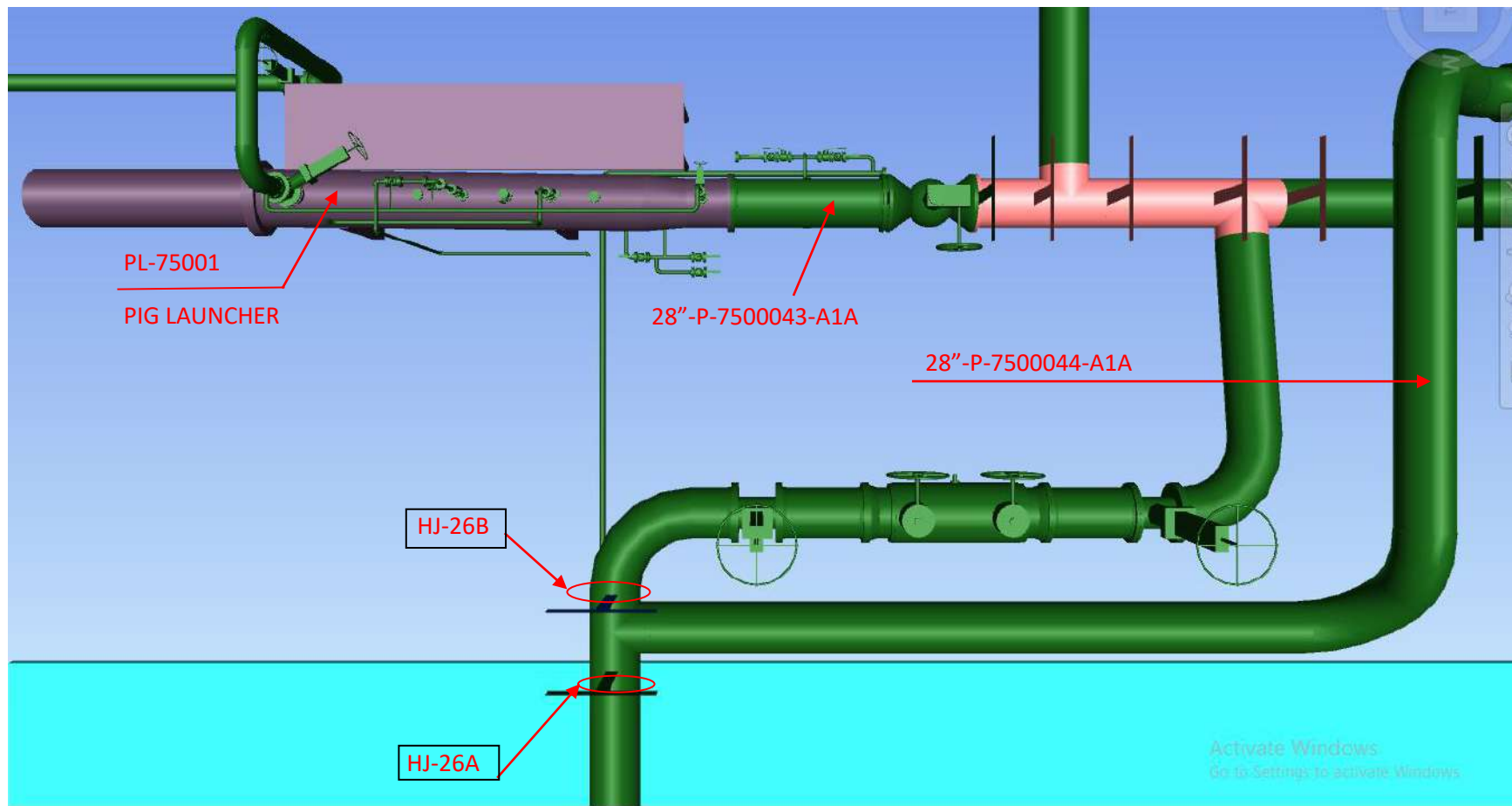
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### 21) HOT JOINT (HJ-26A, HJ-26B) & COLD TAPPING (CT-08) (NEAR FB-7004C TANK)

**Activity:** Line from existing FB-7004C tank to Pig Launcher line (28" MBPL Area) connected line number 28"-P-7500044-A1A with Tee to be replaced with Barred Tee by Hot joint (HJ-26A, HJ-26B). Refer P&ID Number : 750-20005-P-PID-1062.



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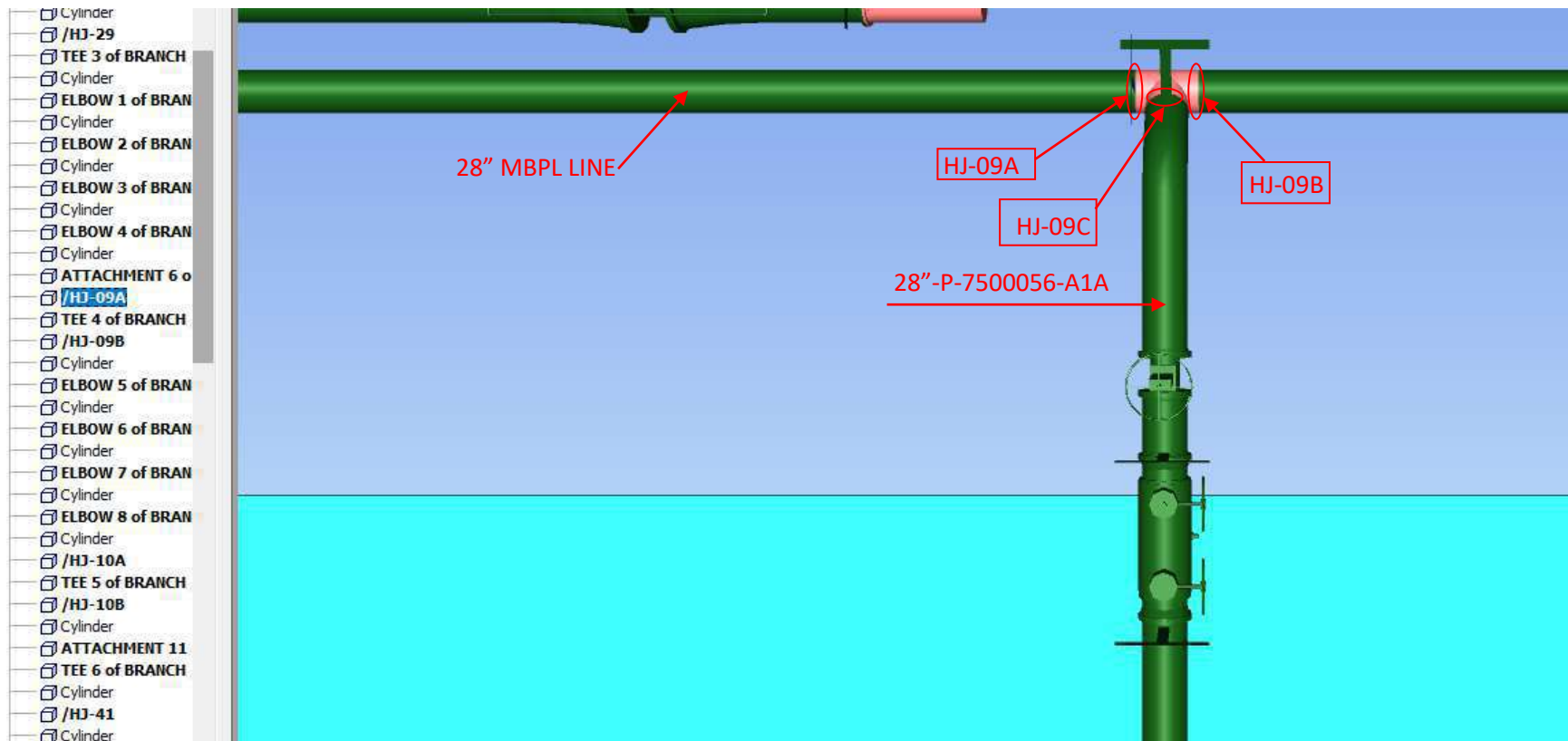
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## 22) HOT JOINT (HJ-9A, HJ-9B, HJ-9C) (NEAR FB-7004D TANK)

**Activity:** Line from existing FB-7004D tank to Pig Launcher (28" MBPL Area) header connected line Tee to be re by Barred Tee by Hot joint (HJ-26A, HJ-26B). Refer P&ID Number : 750-20005-P-PID-1062.



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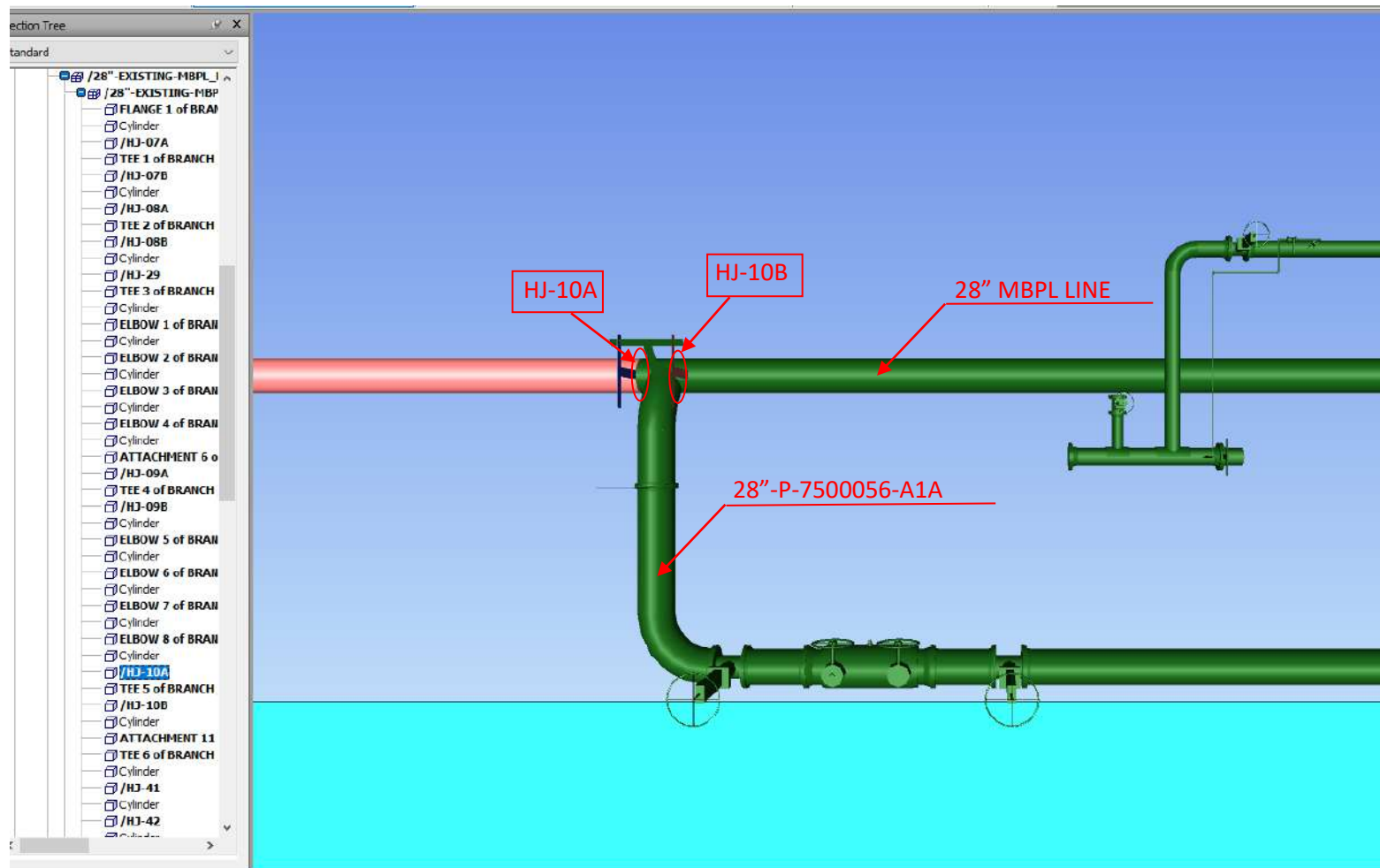
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### 23) HOT JOINT (HJ-10A, HJ-10B) (NEAR FB-7004F TANK)

**Activity:** In existing Pig Launcher Line (28" MBPL line) after connection of FB-7004C tank Tee to be replaced with Barred Tee by Hot Joint (HJ-10A, HJ-10B) line number 28"-P-7500056-A1A. Refer P&ID Number : 750-20005-P-PID-1062.



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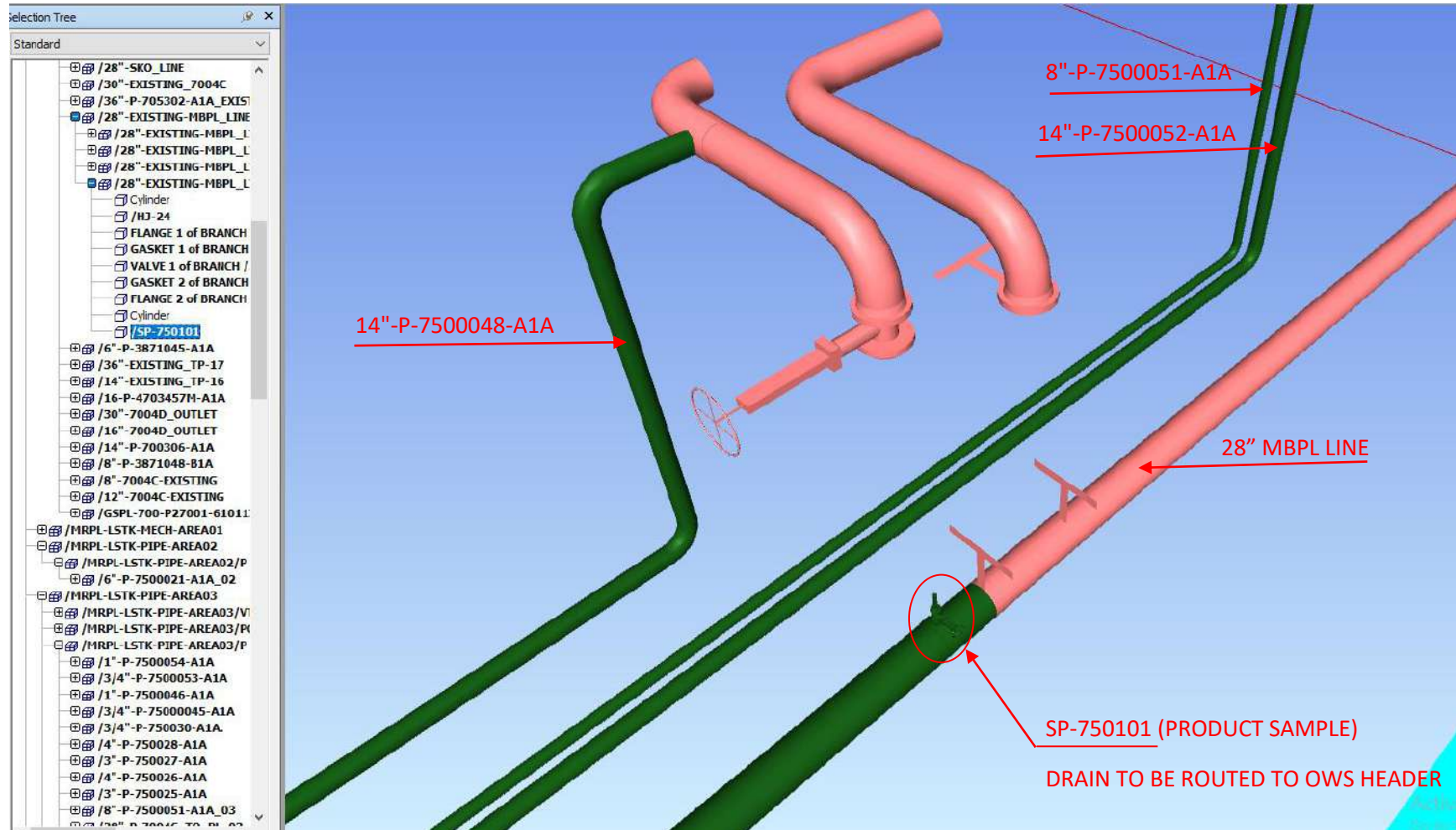
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**24) HOT JOINT (HJ-24) (NEAR FB-7004F TANK)**

**Activity:** New 3" sample line for Sample collection by Hot Joint (HJ-24) from existing 28" MBPL Line from Pig launcher (PL-75001) near to FB-7004F & its drain line number 1"-P-7500047-A1A connected to existing OWS header. Refer P&ID Number : 750-20005-P-PID-1062.





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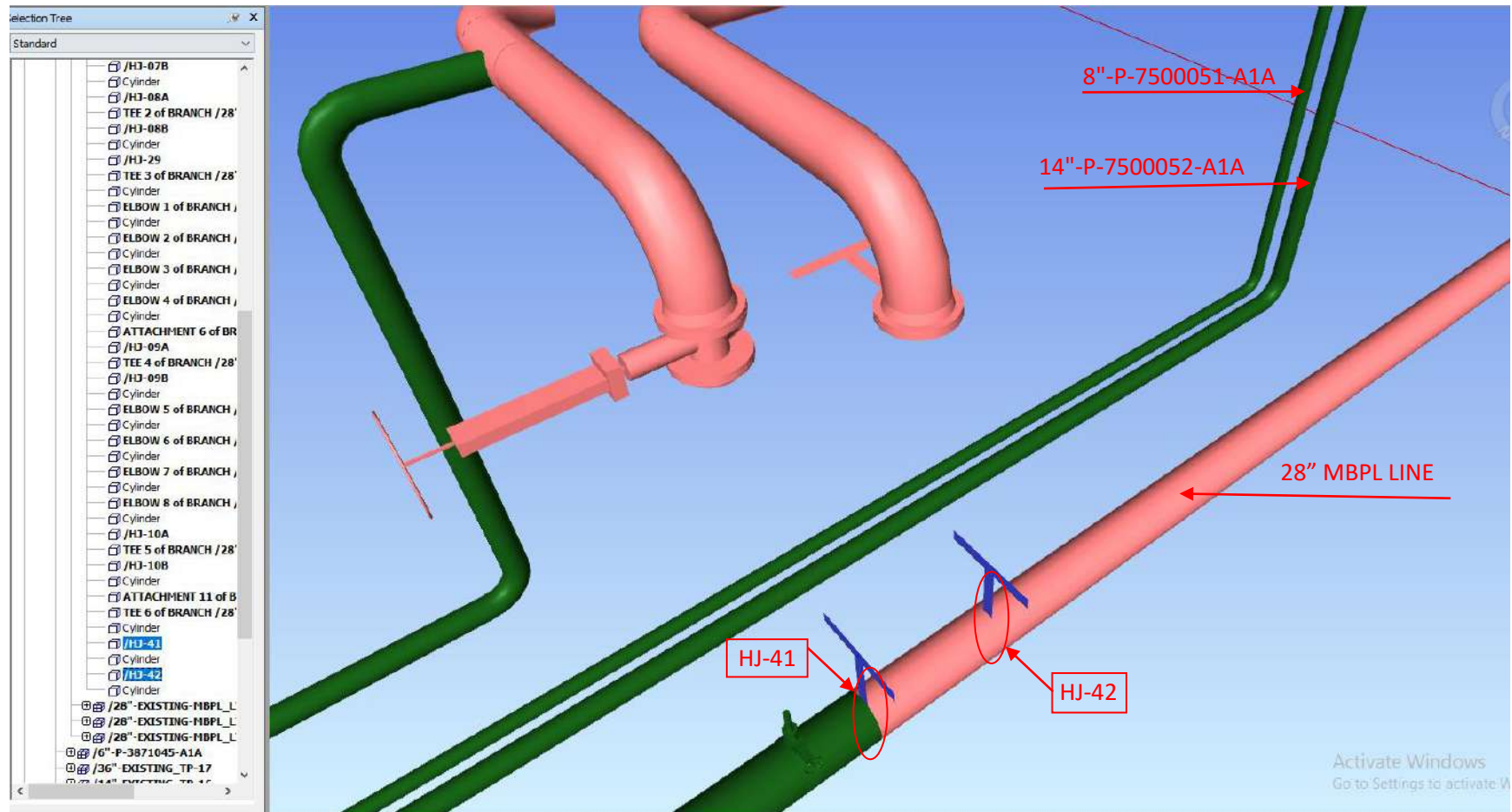
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25) HOT JOINT (HJ-41, HJ-42) & COLD TAPPING (CT-26) (NEAR FB-7004F TANK)

**Activity:** Existing 28" MBPL Line from Pig Launcher having Tee inline that to be removed & line shall be made through by welding 28" Pipe Spool (Hot Joint: HJ-41, HJ-42). Refer P&ID Number : 750-20005-P-PID-1062.



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### 26) HOT TAPPING (HT-07) (NEAR FB-7004C TANK)

**Activity:** Existing 8" Line to FB-7004C tank to be modified to have new line by Hot Tapping (HT-07) and routed a new manifold of line number 12"-P-7500034-A1A. Refer P&ID Number : 750-20005-P-PID-1062.



HJ-07

8" EXISTING FB-7004C TANK OUTLET LINE

12" FB-7004C TANK OUTLET LINE



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### 27) COLD TAPPING (CT-06) (NEAR FB-7004C TANK)

**Activity:** New Line number 12"-P-7500029-A1A to be connected to existing 12" outlet line by cold tapping (CT-06) to make as a manifold to further connections. Refer P&ID Number : 750-20005-P-PID-1062.

12" FB-7004C TANK OUTLET LINE



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

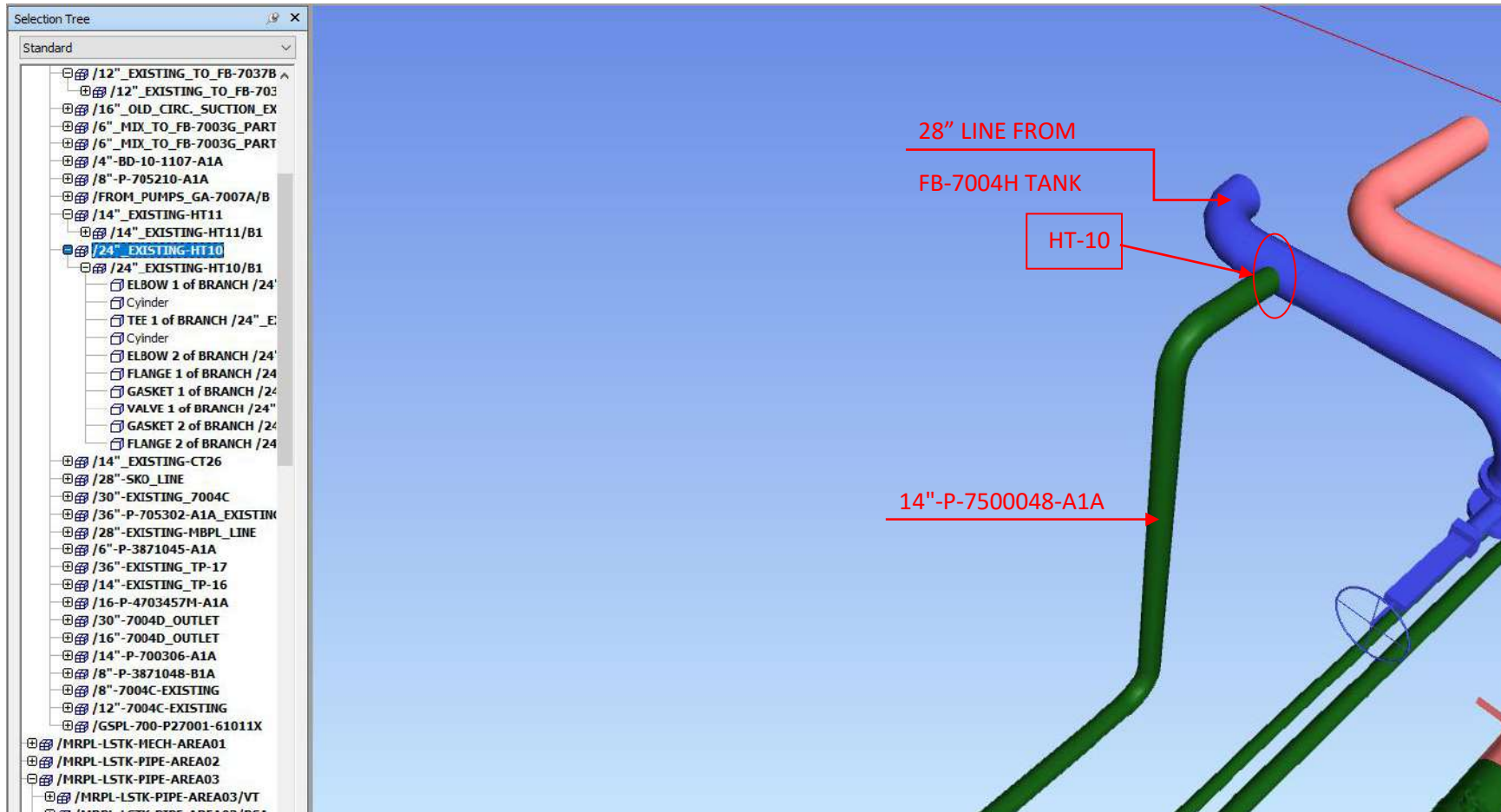
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### 28) HOT TAPPING (HT-10) (NEAR FB-7004F TANK)

**Activity:** New 14"-P-7500048-A1A line to be Hot tapped (HT-10) from 28" FB-7004H tank header line & routed all along to connect with existing header (FB-7004F) connected line number 14"-P-700309-A1A. Refer P&ID Number : 750-20005-P-PID-1062 & 750-20005-P-PID-1063.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

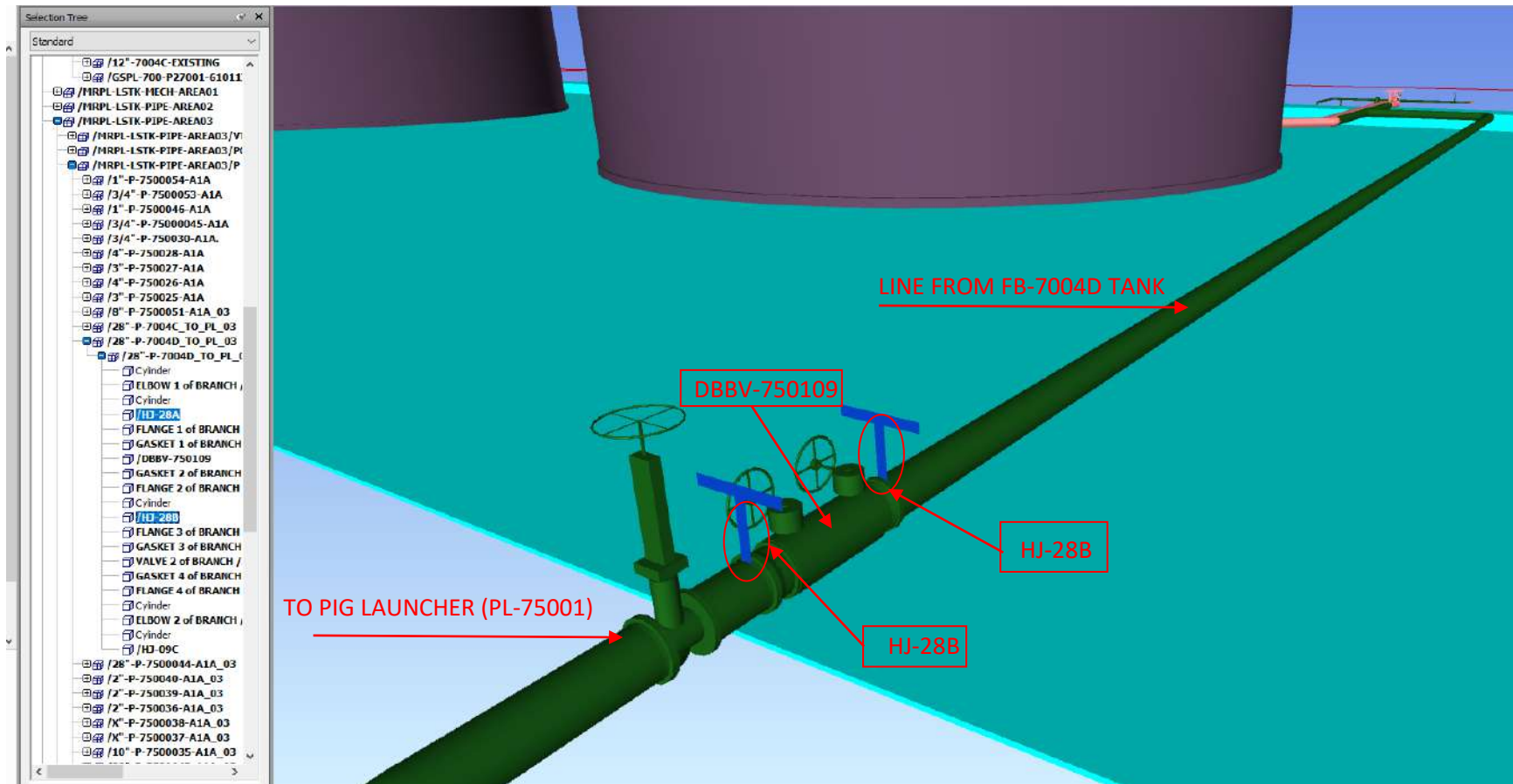
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### 29) HOT JOINT (HJ-28A, HJ-28B) (NEAR FB-7004D TANK)

**Activity:** Line from existing FB-7004D tank to Pig Launcher (28" MBPL Area) header connected line to modify add DBBV-750109 before MOV inline by Hot Joint (HJ-28A, HJ-28B). Refer P&ID Number : 750-20005-P-PID-1062.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

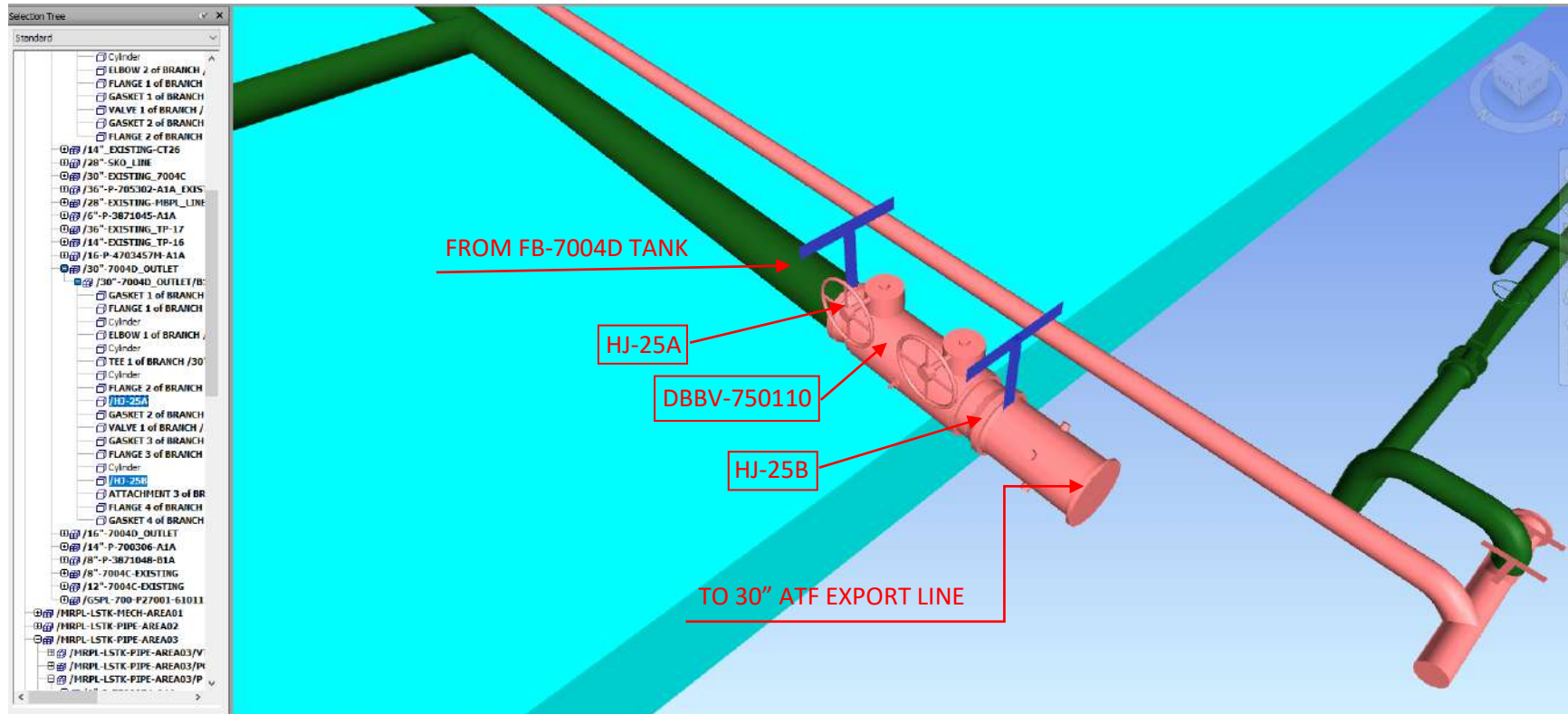
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### 30) HOT JOINT (HJ-25A, HJ-25B) (NEAR FB-7004D TANK)

**Activity:** Existing line from FB-7004D to be modified to add DBBV-750110 by Hot Joint (HJ-25A, HJ-25B) in line before connecting to Existing 30" ATF Export Line. Refer P&ID Number : 750-20005-P-PID-1062.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

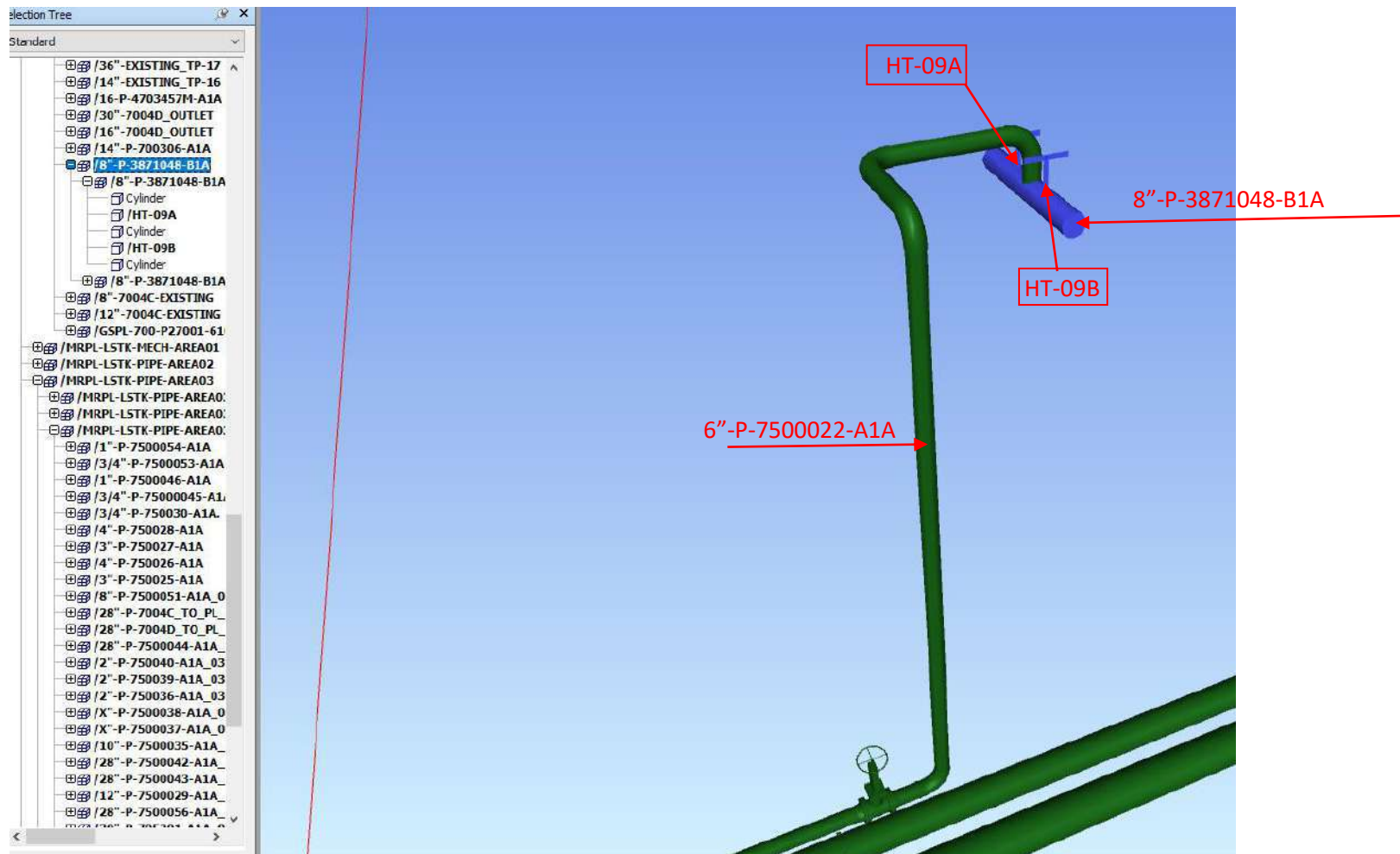
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### 31) HOT TAPPING (HT-09A, HT-09B) (NEAR TO FB-7001E TANK)

**Activity:** New line number 6"-P-7500022-A1A from FB-7004C manifold line number 12"-P-7500029-A1A routed to connect with existing line Number 8"-P-3871048-B1A (HCU-1/HCU-2) by Hot tapping (HT-09A, HT-09B). Refer P&ID Number : 750-20005-P-PID-1062.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

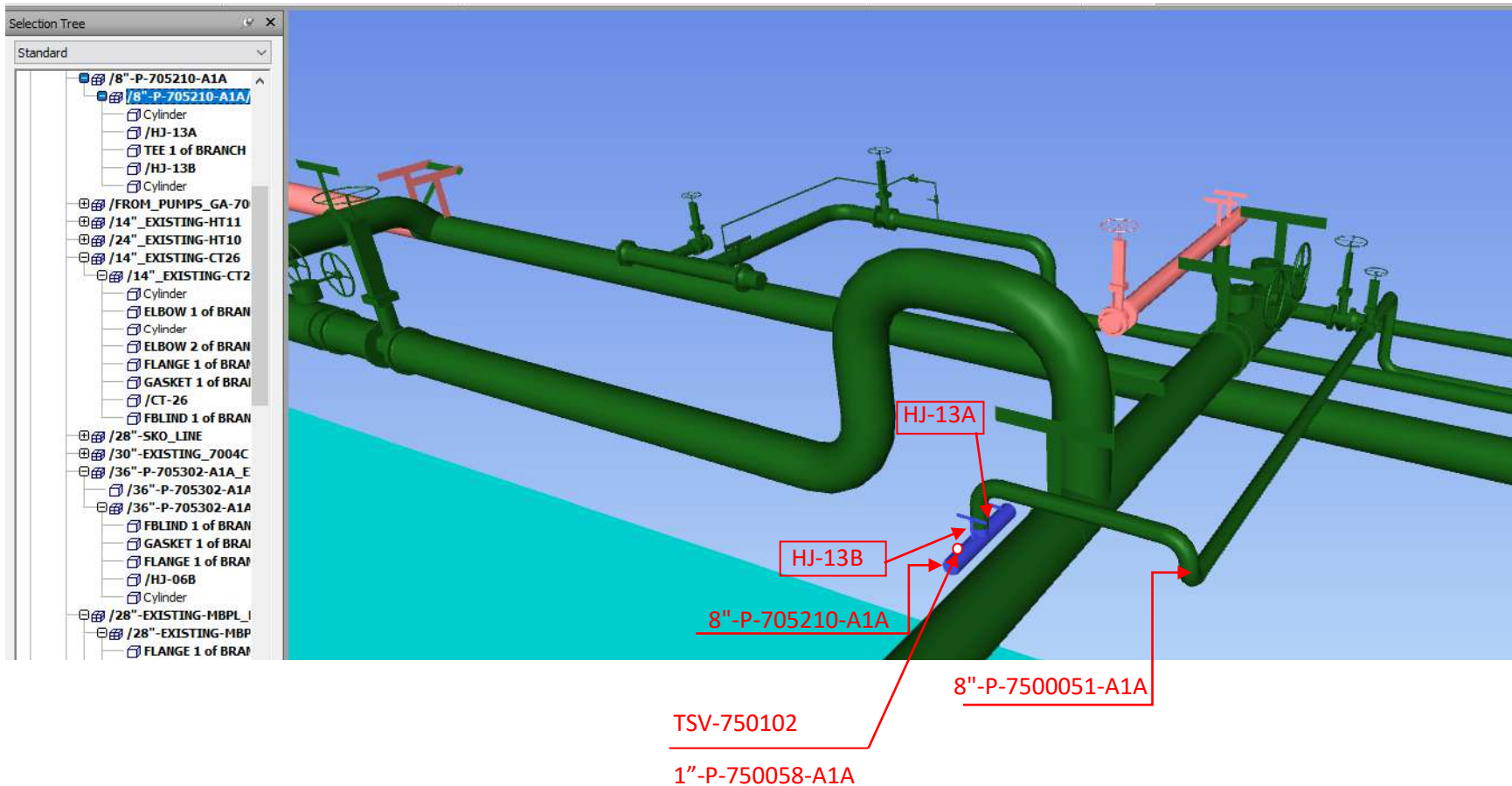
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### 32) HOT JOINT (HJ-13A, HJ-13B) & (HJ-21) (NEAR TO FB-7004F TANK)

**Activity:** Existing line number 8"-P-705210-A1A (FB-7004F Tank) required to modify line by tapping Hot Joint (HJ-21) for TSV-750102 (1"-P-750058-A1A) & also Tee be taken to make new branch line number 8"-P-7500051-A1A by Hot Joint (HJ-13A, HJ-13B) Refer P&ID Number : 750-20005-P-PID-1063.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

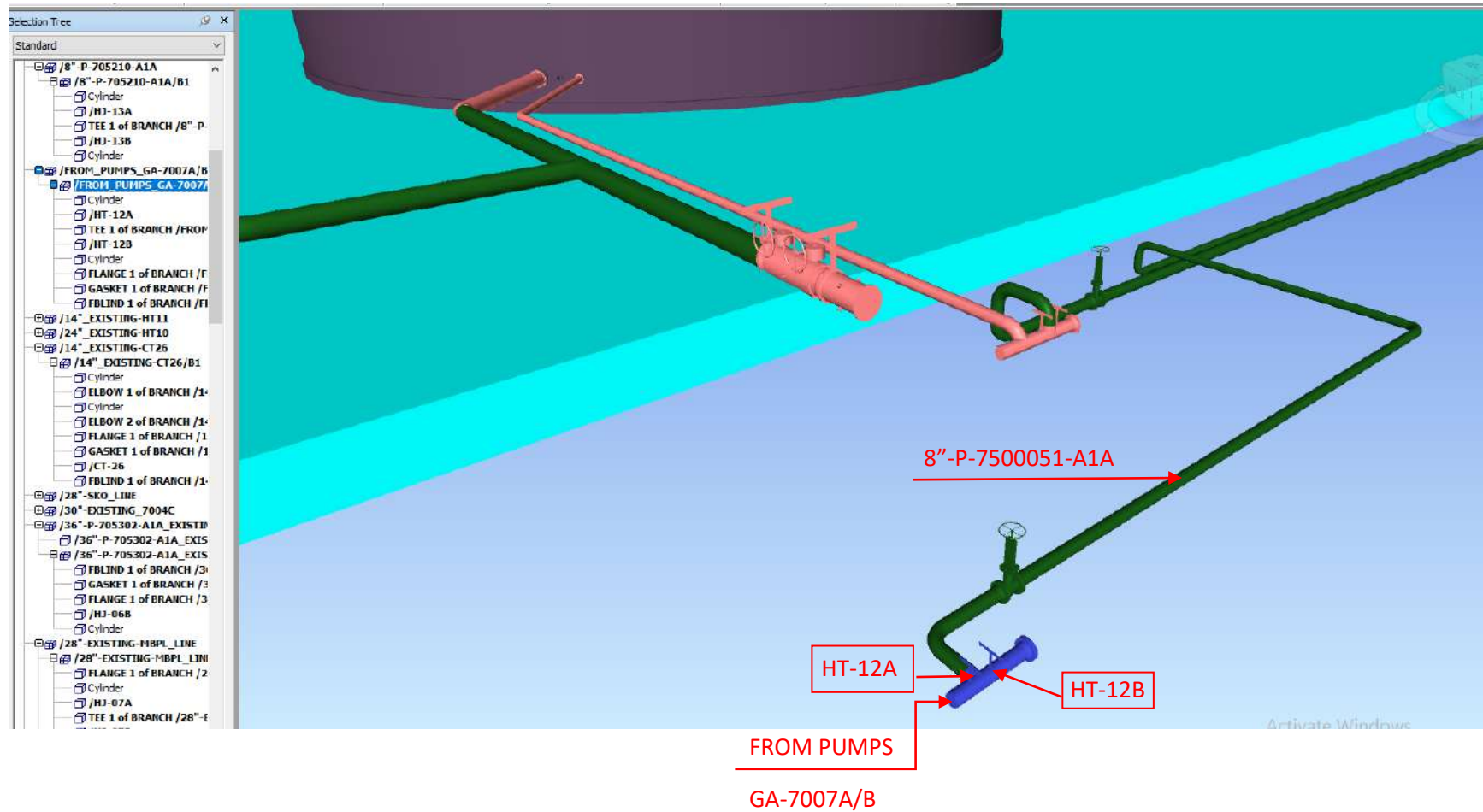
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### 33) HOT TAPPING (HT-12) (NEAR TO FB-7004D TANK)

**Activity:** Existing line number 8"-P-705210-A1A modified by Hot Joint & routed new line number 8"-P-7500051-A1A & routed all along to connect with existing Pump header GA-7007A/B by Hot Tapping (HT-12A, HT-12B) Refer P&ID Number : 750-20005-P-PID-1063.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

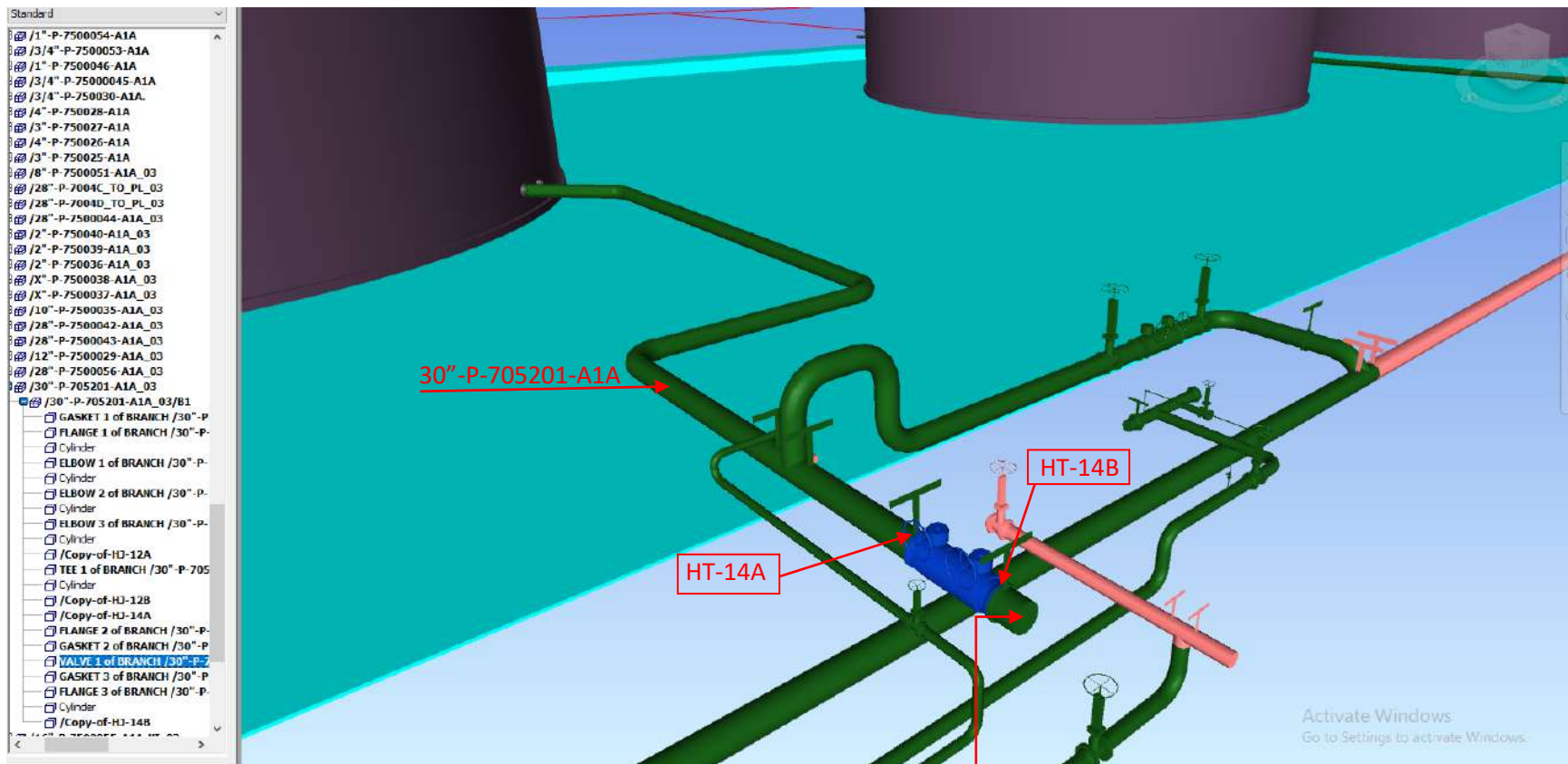
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### 34) HOT JOINT (HJ-14A, HJ-14B) (NEAR FB-7004F TANK)

**Activity:** New DBBV-750113 to be added in 30" Existing ATF Export Pump suction line number 30"-P-705201-A1A by modifying line by Hot Joint (HJ-14A, HJ-14B) connected to FB-7004F (ATF Tank) Refer P&ID Number : 750-20005-P-PID-1063.



30" EXISTING ATF  
EXPORT PUMP HEADER

Title : CONSTRUCTION TENDER

Project No. : JBGD20005

Doc. No.: - 750-20005-GEN-L-DOC-0001

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### 35) COLD TAPPING (CT-11) (NEAR FB-7004F TANK)

**Activity:** 16" existing Manifold Header from FB-7004F to be extended by connection new line number 16"-P-7500055-A1A by Cold Tapping (CT-11) and routed to connect further more tapping's. Refer P&ID Number : 750-20005-P-PID-1063.



Title : CONSTRUCTION TENDER

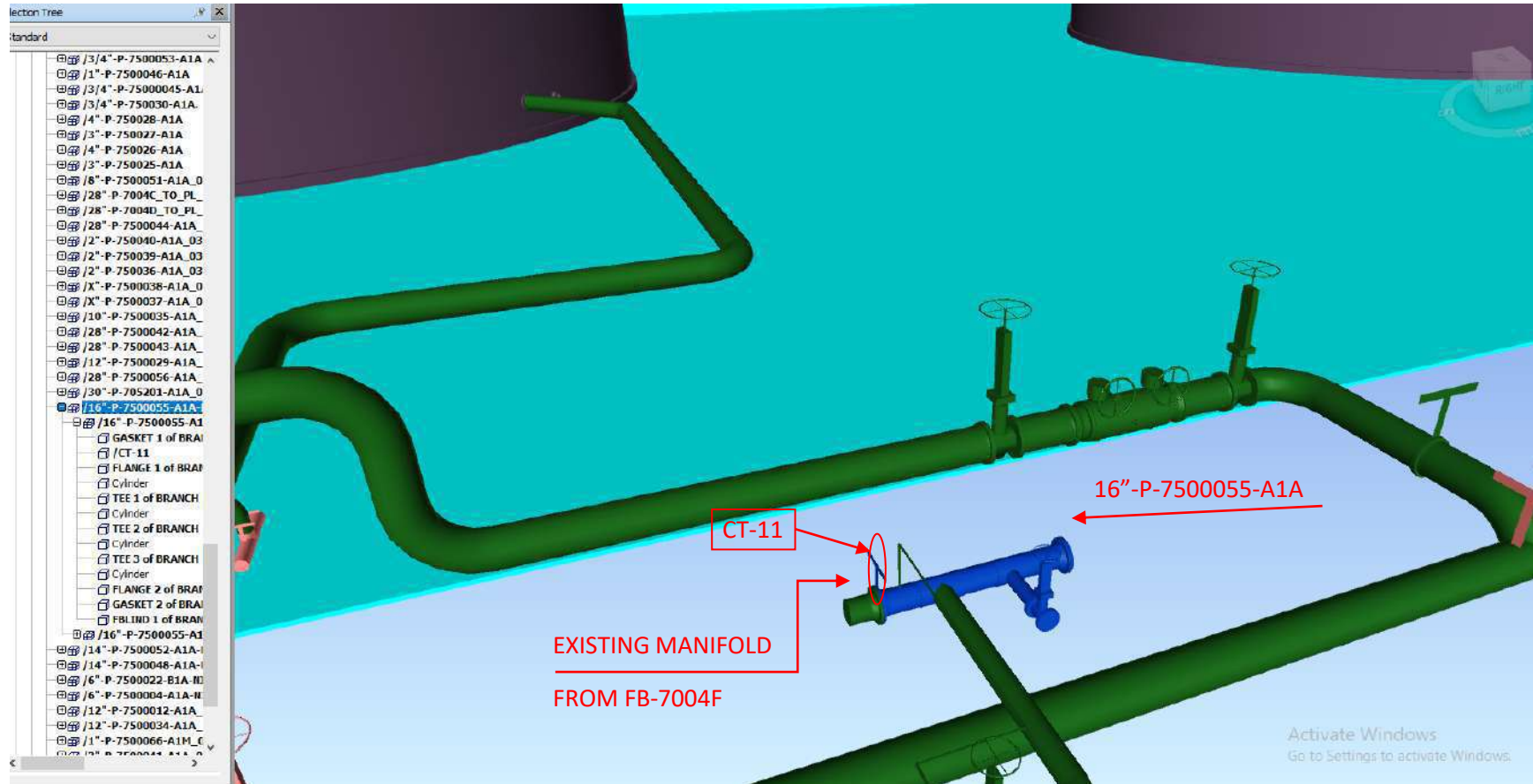
Project No. : JBGD20005

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3D MODEL SNAP:





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

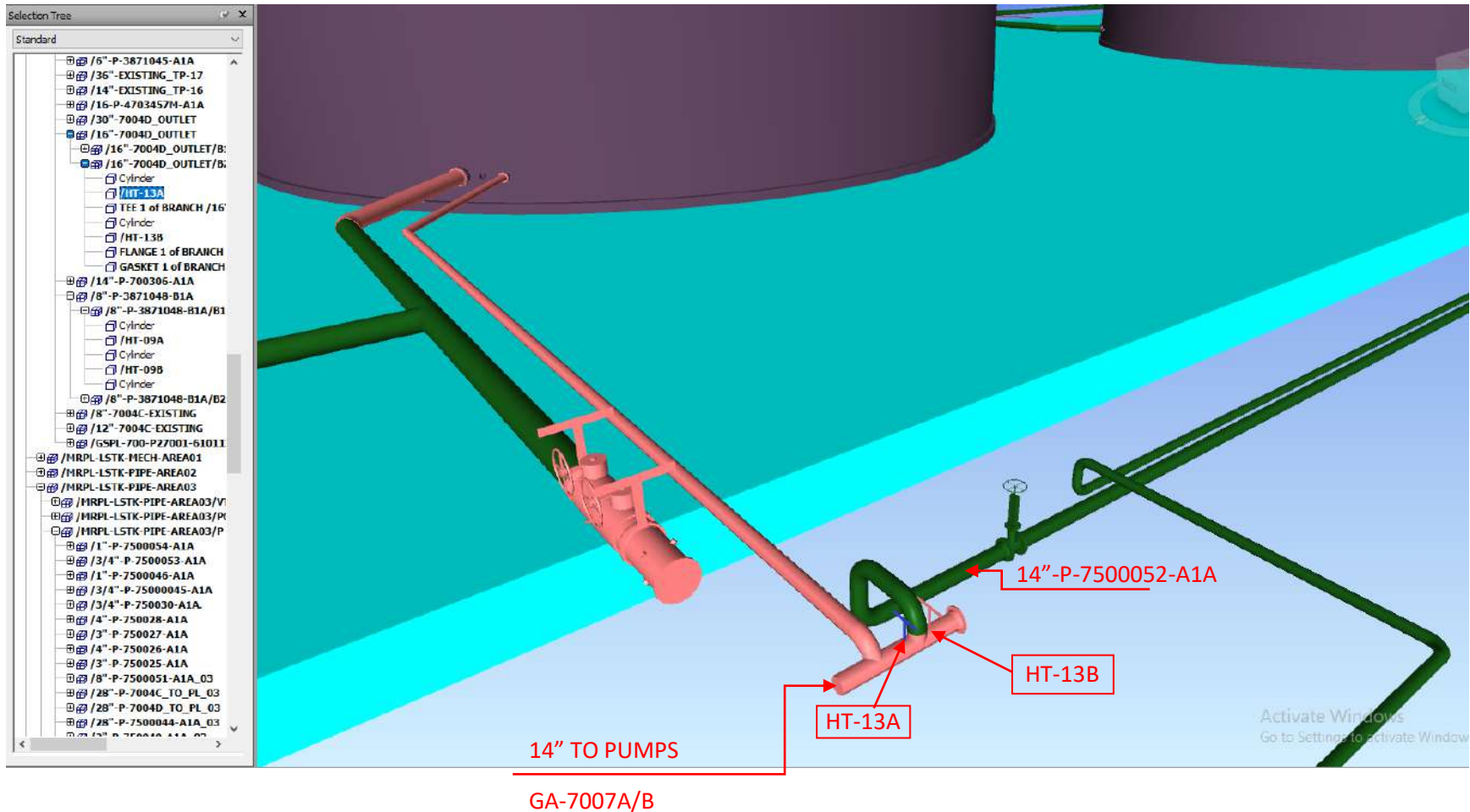
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### 36) HOT TAPPING (HT-13A, HT-13B) (NEAR FB-7004D TANK)

**Activity:** New line number 14"-P-7500052-A1A connected to new manifold line number 16"-P-7500055-A1A is routed to connect with existing Pumps Header GA-7007A/B by Hot Tapping (HT-13A, HT-13B) Refer P&ID Number : 750-20005-P-PID-1063.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

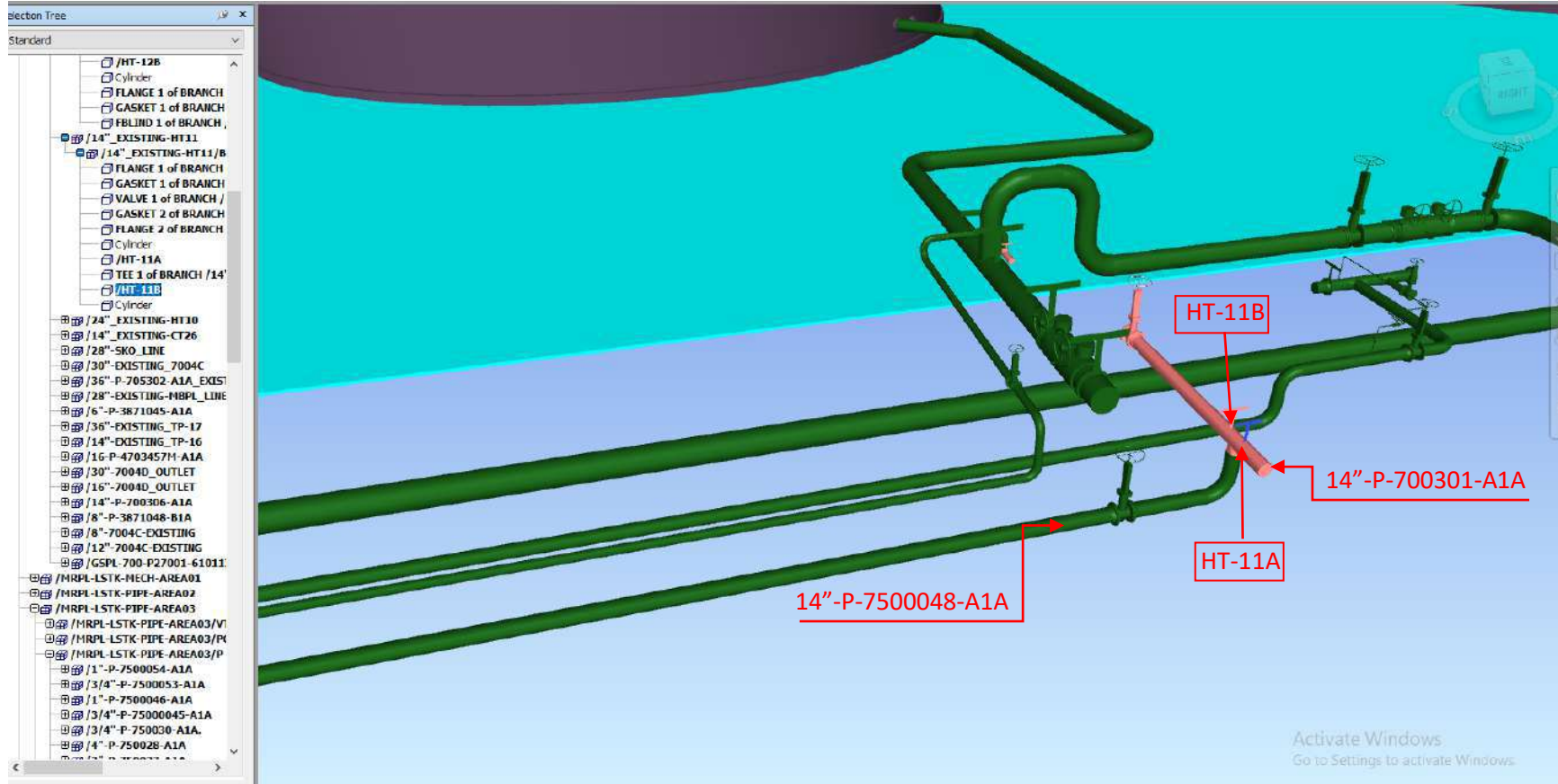
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### 37) HOT TAPPING (HT-11A, HT-11B) (NEAR FB-7004D TANK)

**Activity:** New line number 14"-P-7500048-A1A taken Hot Tapping (HT-10) from existing 28" FB-7004H Tank to be routed all along to connect with existing marketing Pump Suction line number 14"-P-700309-A1A by Hot Tapping (HT-11A, HT-11B) Refer P&ID Number : 750-20005-P-PID-1063.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

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### 38) HOT TAPPING (HT-16A, HT-16B) (NEAR PUMP HOUSE 7)

**Activity:** New line number 14"-P-7500070-A1A routed along existing 14" existing line (Disconnected line from FB-7037B) by Hot Tapping (HT-16A, HT-16B). Refer P&ID Number : 750-20005-P-PID-1064.



EXISTING 14" LINE

New Tapping 14"-P-750070-A1A

HT-16A, HT-16B

Title : CONSTRUCTION TENDER

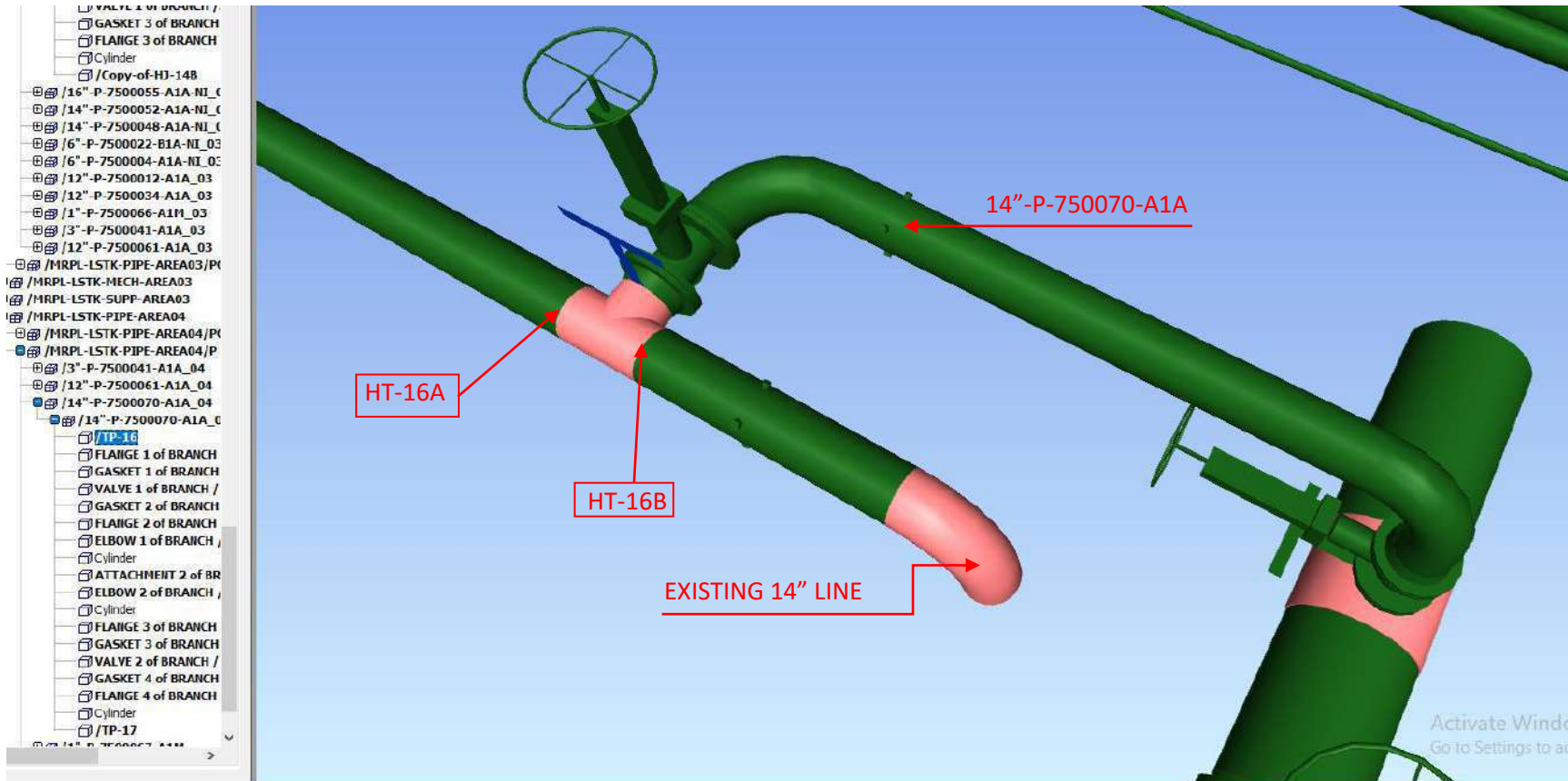
Project No. : JBGD20005

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3D MODEL SNAP:





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

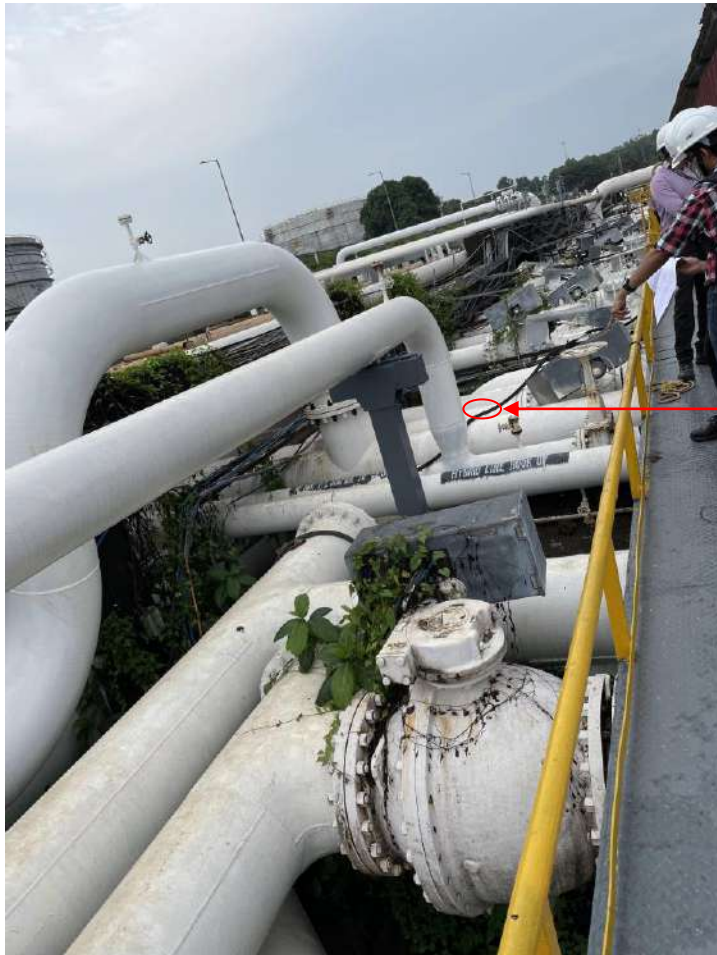
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### 39) HOT JOINT (HT-17) (NEAR PUMP HOUSE -7)

**Activity:** New line number 14"-P-750070-A1A routed from existing 14" existing line & connected to existing KERO Suction line by Hot Tapping on 36" line (HT-17) Refer P&ID Number : 750-20005-P-PID-1063.



HT-17

36" EXISTING KERO SUCTION LINE

Title : CONSTRUCTION TENDER

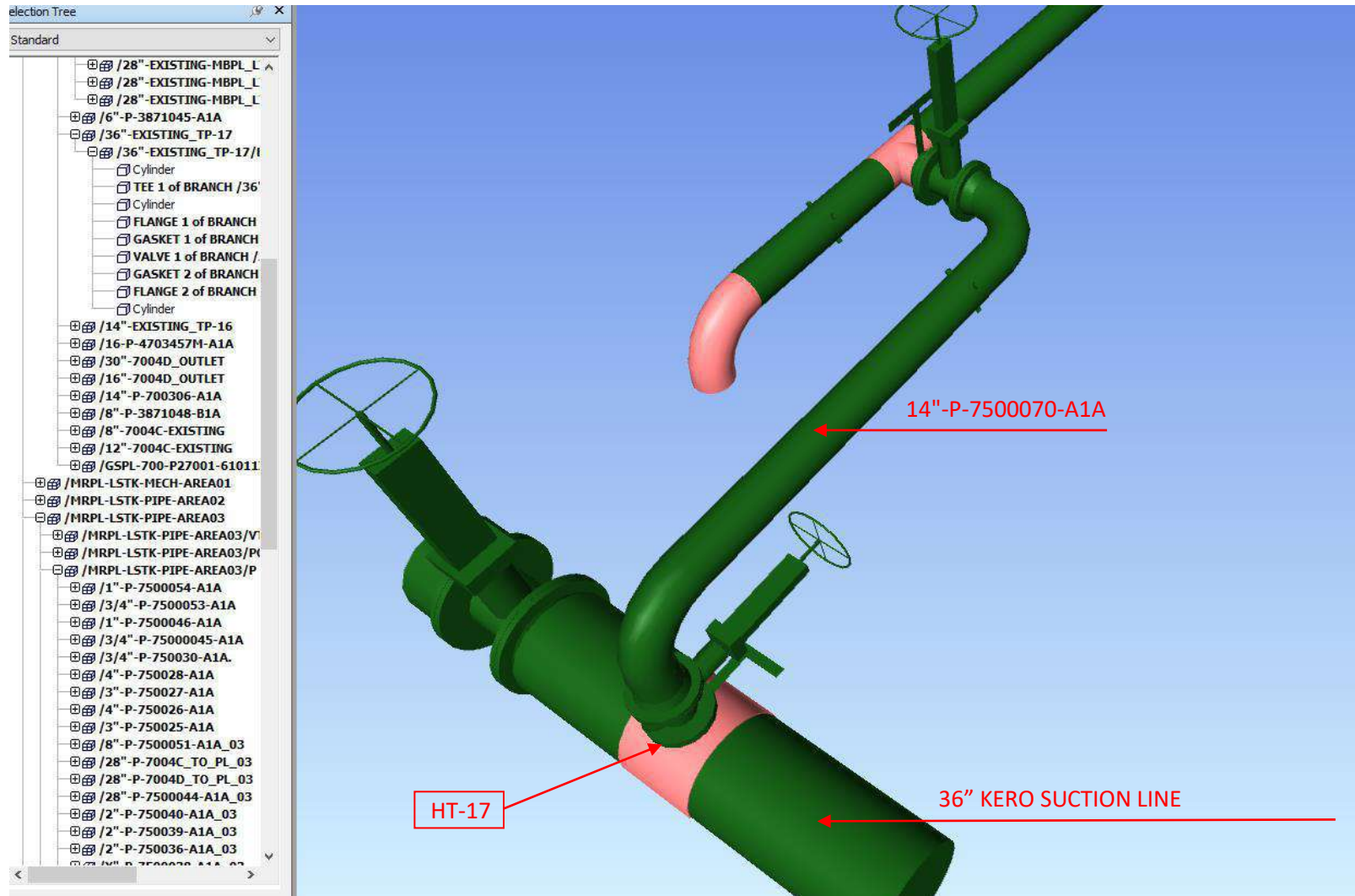
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3D MODEL SNAP:



Title : CONSTRUCTION TENDER

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#### 40) HOT JOINT (HJ-31 & HJ-32) (IN PETRONET AREA)

**Activity:** The Existing line number 28"-P-10-1707-A1A line to be modified & blinded one end by Hot Joint (HJ-31) & other end routed with new line connecting to new PIG RECIEVER by Hot Joint (HJ-32). Refer P&ID Number : 750-20005-P-PID-1065.





Title : CONSTRUCTION TENDER

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Title : CONSTRUCTION TENDER

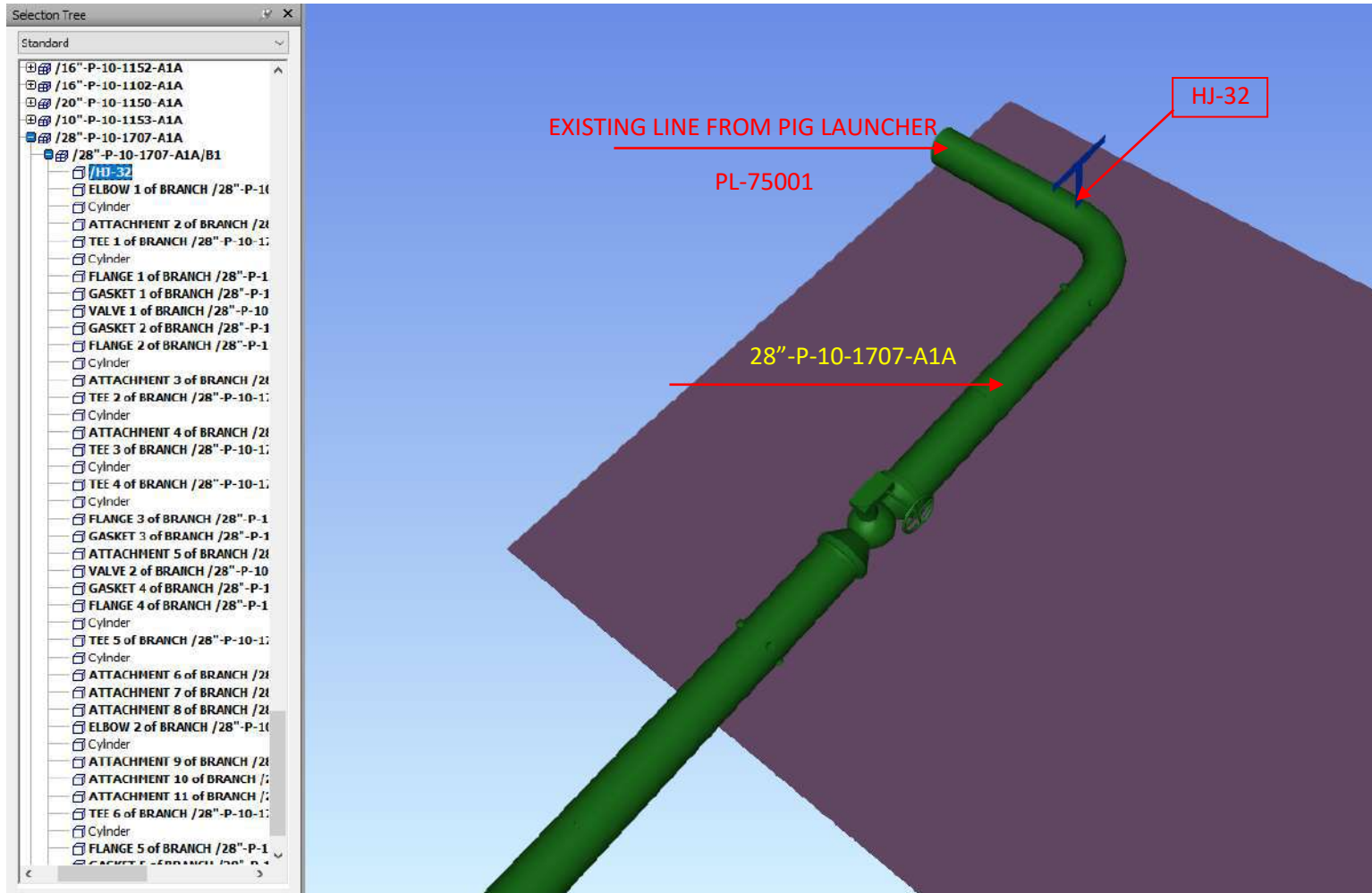
Project No. : JBGD20005

Doc. No.: - 750-20005-GEN-L-DOC-0001

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3D MODEL SANP:



Title : CONSTRUCTION TENDER

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#### 41) COLD TAPPING (CT-33) (IN PETRONET AREA)

**Activity:** Existing line number 28"-P-10-1707-A1A modified to connect with Pig Launcher line accordingly TSV to be re-connected by Cold Tapping (CT-33). Refer P&ID Number : 750-20005-P-PID-1065.



CT-33

1"-P-10-1162-A1A

28"-P-10-1707-A1A



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

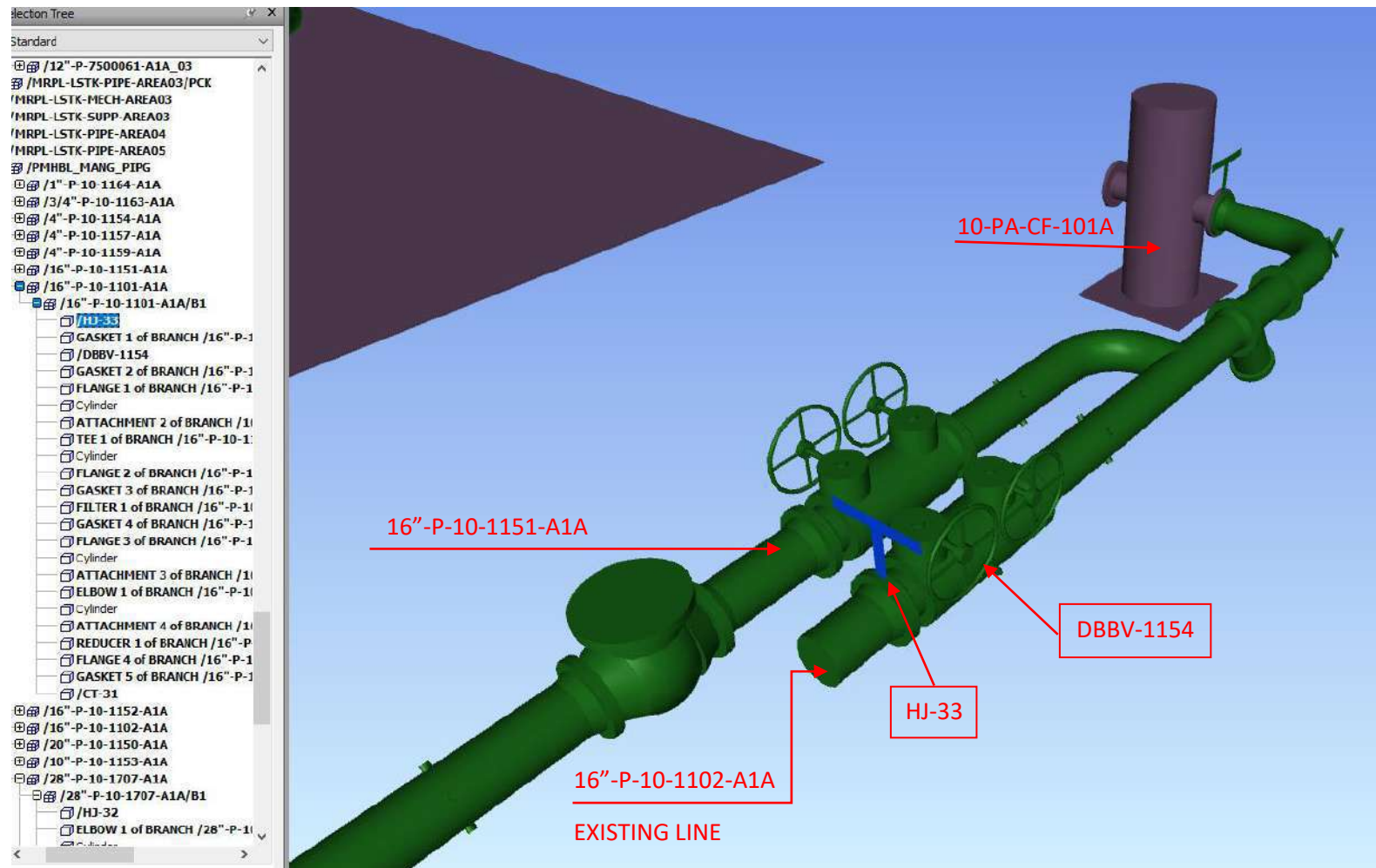
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42) HOT JOINT (HJ-33) (IN PETRONET AREA)

**Activity:** In existing pump (Booster pump - 10-PA-CF-101A) suction line number 16"-P-10-1102-A1A modified to accommodate new DBBV-1154 by Hot Joint (HJ-33). Refer P&ID Number : 750-20005-P-PID-1065.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

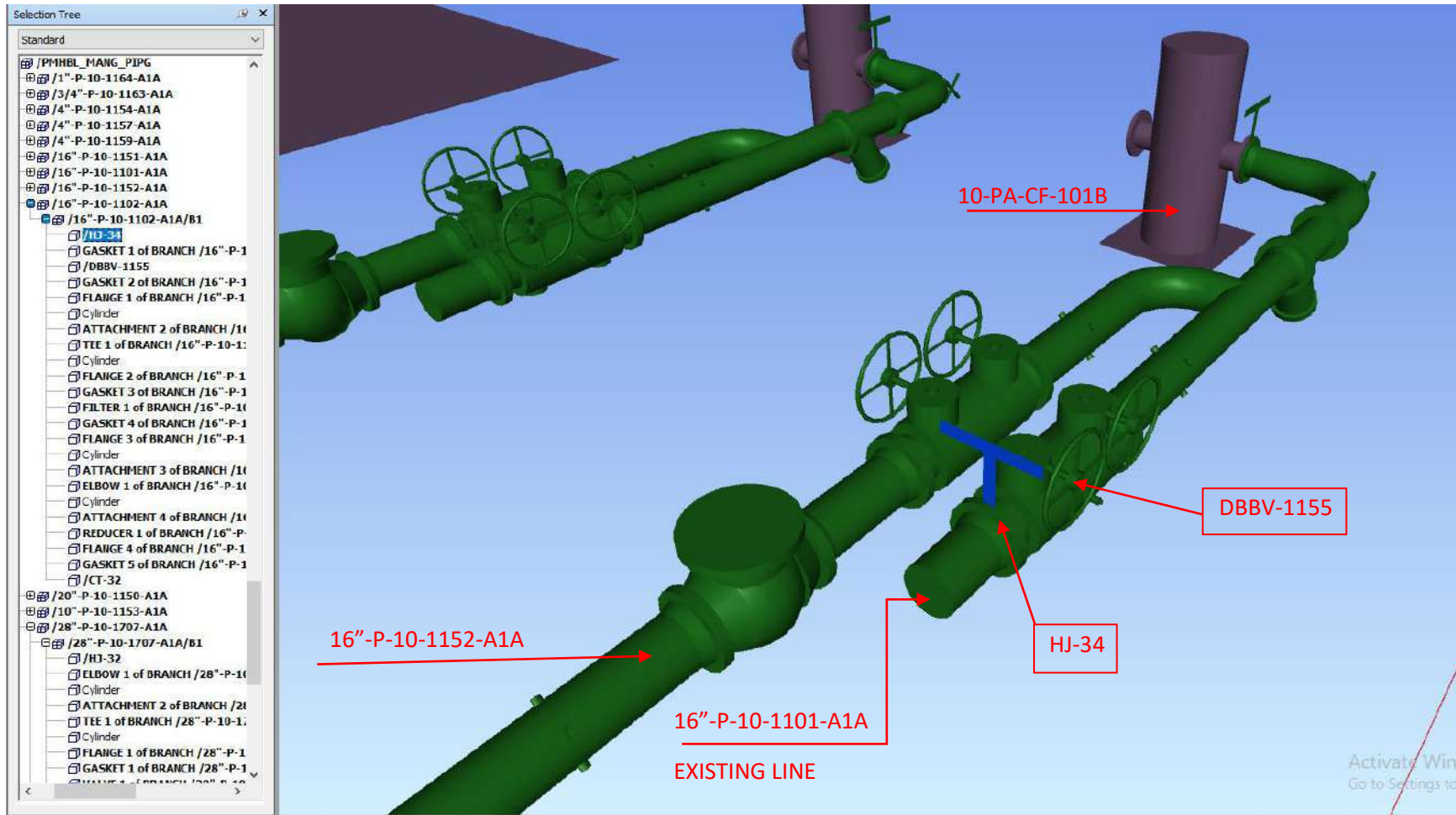
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**43) HOT JOINT (HJ-34) (IN PETRONET AREA)**

**Activity:** In existing pump (Booster pump - 10-PA-CF-101B) suction line number 16"-P-10-1101-A1A modified to accommodate new DBBV-1155 by Hot Joint (HJ-34). Refer P&ID Number : 750-20005-P-PID-1065.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

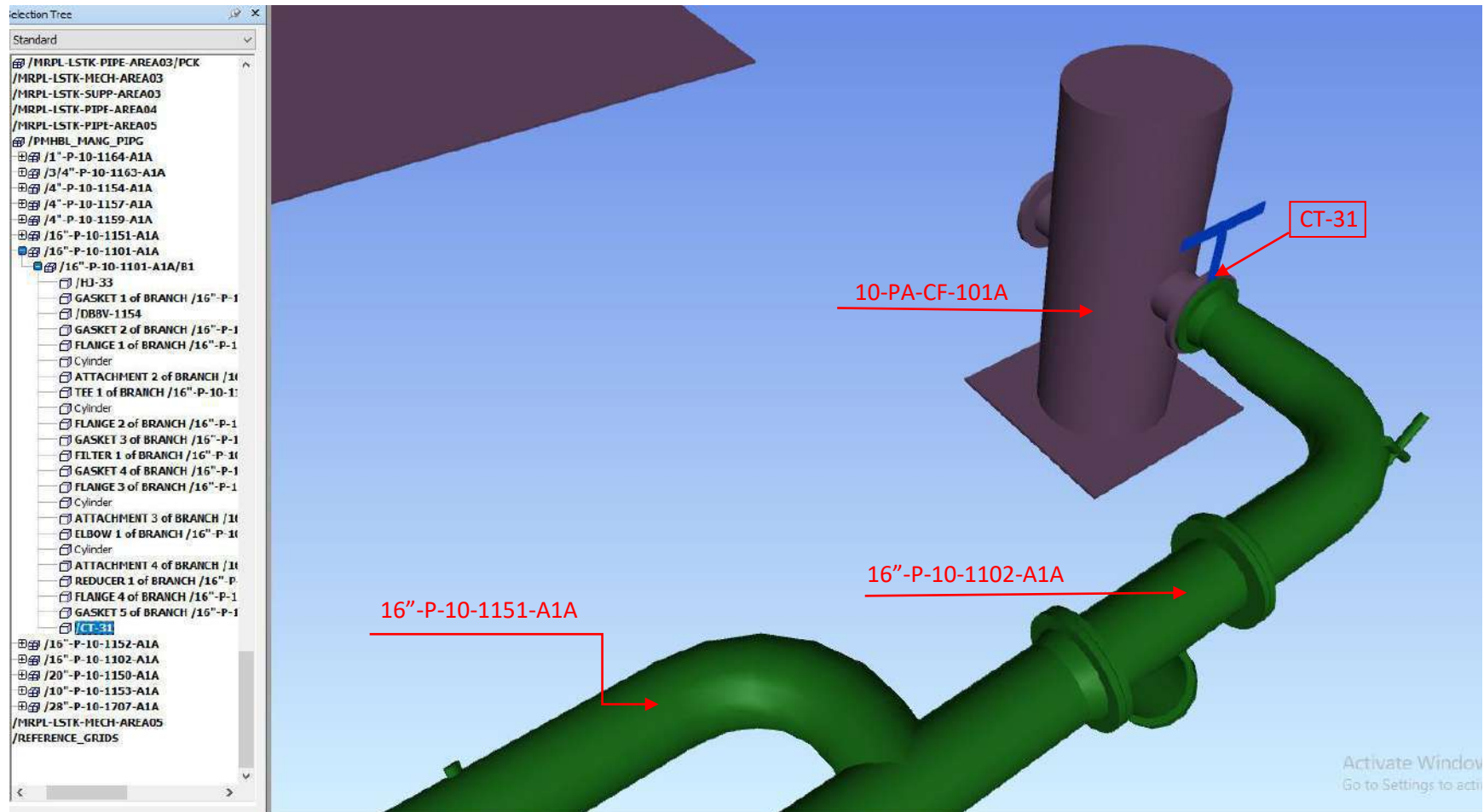
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#### 44) COLD TAPPING (CT-31) (IN PETRONET AREA)

**Activity:** Booster Pump (10-PA-CF-101A) existing line number 16"-P-10-1102-A1A to be modified to accommodate additional line number 16"-P-10-1151-A1A & DBBV-1154 connecting pump by Cold Tapping (CT-31). Refer P&ID Number : 750-20005-P-PID-1065.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

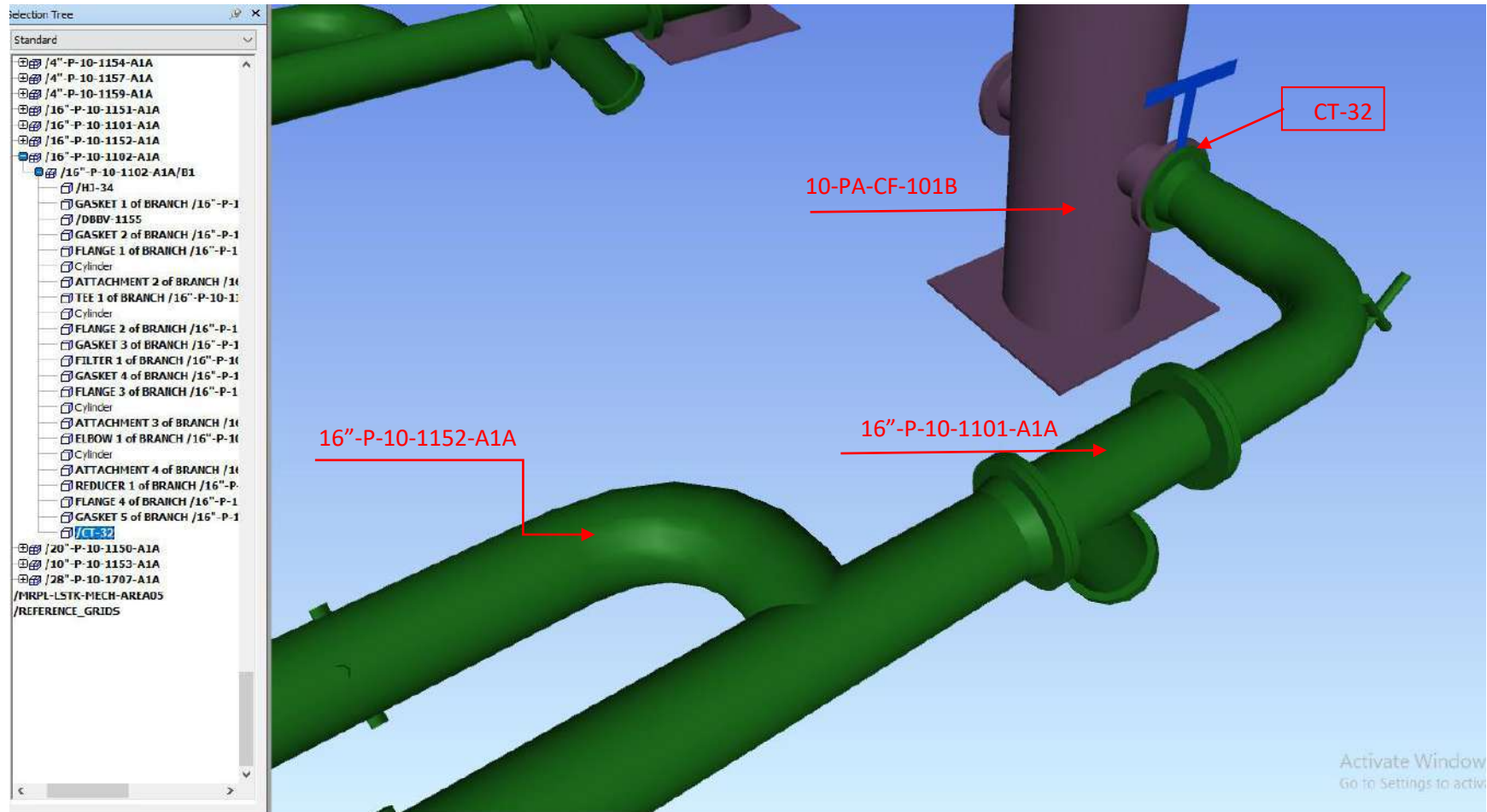
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#### 45) COLD TAPPING (CT-32) (IN PETRONET AREA)

**Activity:** Booster Pump (10-PA-CF-101B) existing line number 16"-P-10-1101-A1A to be modified to accommodate additional line number 16"-P-10-1152-A1A & DBBV-1155 connecting pump by Cold Tapping (CT-32). Refer P&ID Number : 750-20005-P-PID-1065.



Title : CONSTRUCTION TENDER

Project No. : JBGD20005

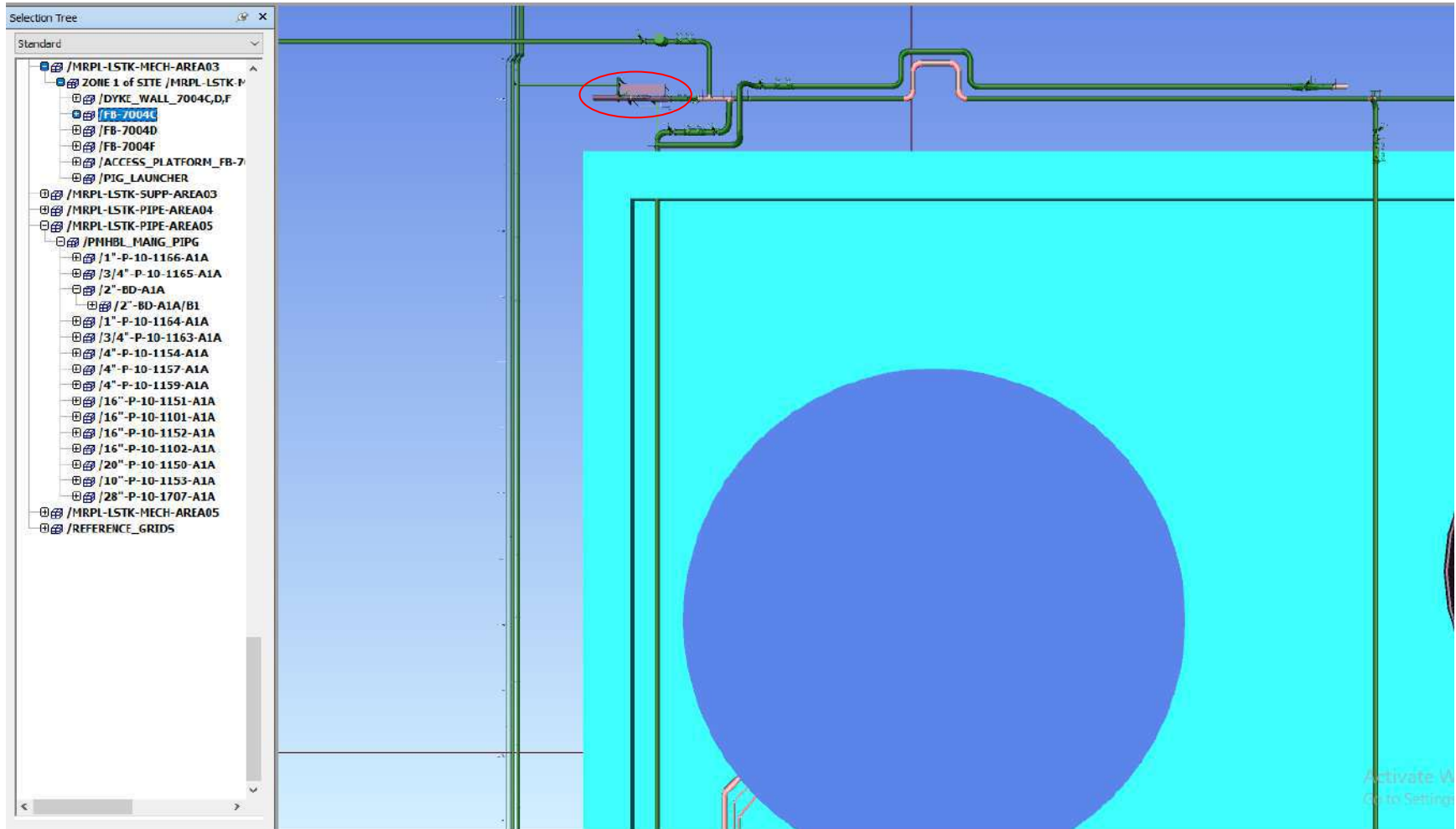
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**46) NEW PIG LAUNCHER (PL-75001) : (NEAR FB-7004C TANK)**

**Activity:** As per process requirement new Pig launcher is installed by modifying existing 28" MBPL Line to provide clear space from edge of Launcher to Existing Pipe Rack. It also consists of new drain line, Kicker Line, TSV drains. Refer P&ID Number : 750-20005-P-PID-1062.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

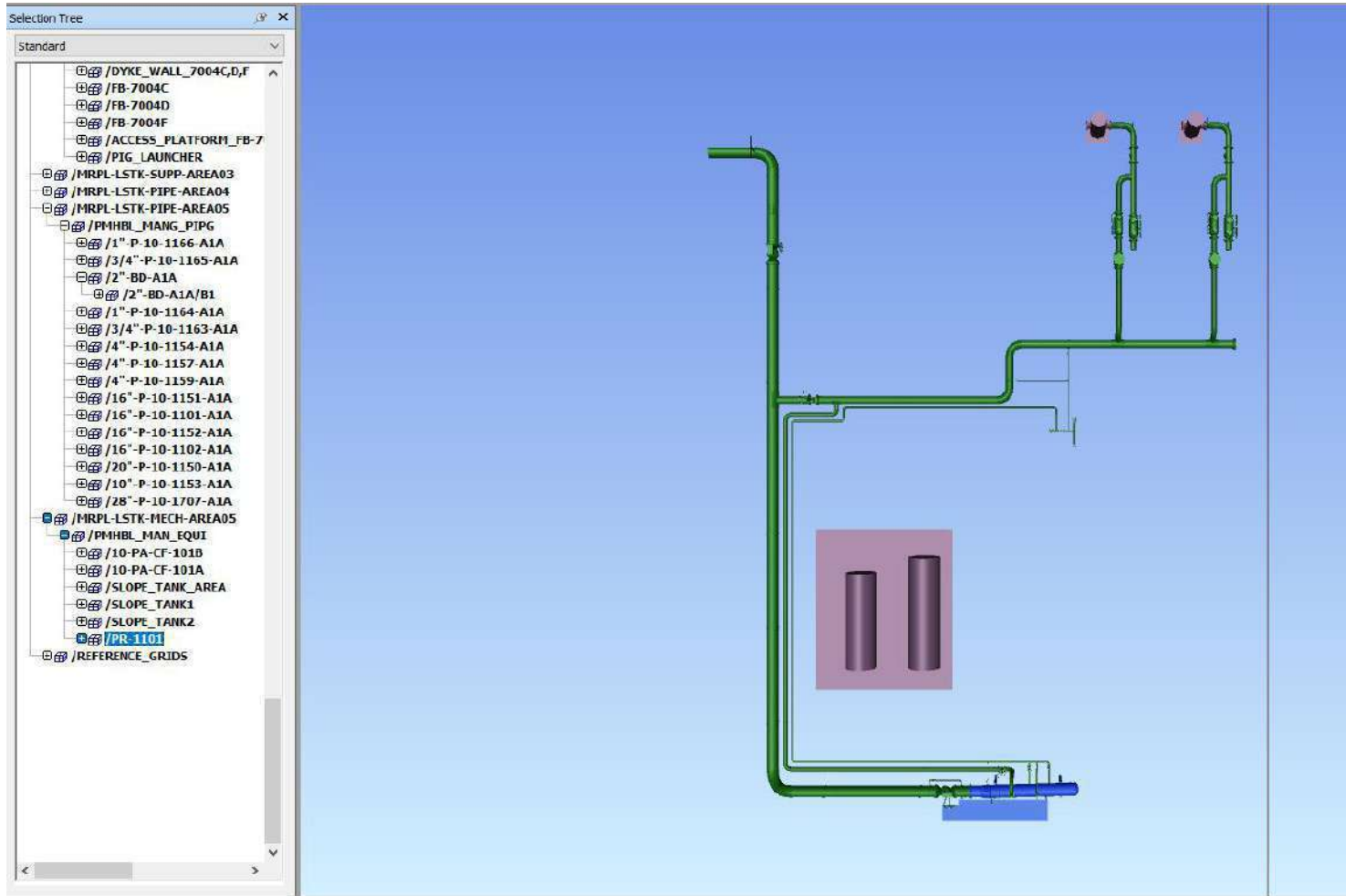
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**47) NEW PIG RECEIVER (PR-1101) : (NEAR PETRONET AREA)**

**Activity:** As per process requirement new Pig Receiver is located in Petronet area as identified during site survey. Refer P&ID Number : 750-20005-P-PID-1065.



**Title : CONSTRUCTION TENDER**

**Project No. : JBGD20005**

**Doc. No.: - 750-20005-GEN-L-DOC-0001**

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**48) NEW LUBRICITY TANK (FA-75003) & DOSING PUMP (GA-M-75004) (INSIDE PUMP HOUSE-3)**

**Activity:** As per process requirement new lubricity tank to be installed inside of Pump House -3 Shed in between 2 existing Pumps GA-7007A & GA-7007B BY Hot Joint to existing line numbers of pump suction like 12"-P-700356-A1A (HJ-16) & 12"-P-700357-A1A (HJ-17). Refer P&ID Number : 750-20005-P-PID-1064.

**49) NEW PUMP (GA-75002) : (INSIDE PUMP HOUSE – 3)**

**Activity:** As per process requirement new Pump (GA-75002) to be located inside Existing Pump House -3 Shed, both suction & discharge lines are routed all along to connected with Manifolds of FB-7004C Tank. Refer P&ID Number : 750-20005-P-PID-1064.

**50) HOT JOINT : (HJ-03A, HJ-03B, HJ-03C) FOAM CONNECTION TO EXISTING TANK FB-7037B (CONNECTED TO FB-7037B PCA STORAGE TANK)**

**Activity:** Additional flanges to be provide at inlet line of FOAM CONNECTION by Hot Joint (HJ-03A, HJ-03B, HJ-03C)

**51) COLD TAPPING: (CT-02A, CT-02B) (NEAR WHITE OIL PUMP HOUSE SHED)**

**Activity:** Existing 16" suction line from FB-7037B tank to be disconnected from Pump GA-7009A suction header by cold tapping (CT-02A, CT-02B). Refer P&ID Number : 750-20005-P-PID-1061.

**52) COLD TAPPING (CT-28 & CT-27) & HOT JOINT (HJ-43) (NEAR MRPL / HPCL AREA)**

**Activity:** Existing Gate Valve near MRPL/HPCL Area to be removed & replaced with new Full Bore Ball Valve by Cold Joint (CT-28) & Hot Joint (HJ-43), also 1" Thermowell shall be dismantled & blinded with new blind flange (CT-27). Refer P&ID Number : 750-20005-P-PID-1062.

**53) HOT JOINT (HJ-15A/B/C/D/E/F/G) (CONNECTED TO FB-7004F TANK)**

**Activity:** Additional flanges to be provide at inlet line of FOAM CONNECTION by Hot Joint (HJ-15A/B/C/D/E/F/G)

Title : CONSTRUCTION TENDER

Project No. : JBGD20005

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#### 54) HOT TAPPING (HJ-11A, HJ-11B) (NEAR FB-7004F TANK)

**Activity:** Existing manifold of Tank FB-7004F connected line number 8"-P-705205-A1A from ATF Rundown (ATF EX CDO N) to be modified & added 8" DBBV-750112 in line by Hot Joint (HJ-11A, HJ-11B) Refer P&ID Number : 750-20005-P-PID-1063.

#### 55) COLD TAPPING (CT-12) (NEAR PUMP HOUSE -3)

**Activity:** New drain line from New Pump GA-75002 & TSV-75011 is connected to header line number 3"-P-7500041-A1A & also another line routed all along from Pig Launcher drains to header & connected to CBD Tank near Pump House-3 by cold taping (CT-12). Refer P&ID Number : 750-20005-P-PID-1064.

#### 56) HOT JOINT (HJ-16, HJ-17) (INSIDE PUMP STATION-3)

**Activity:** New Lubricity Tank will be located inside Pump House -3 near to two existing pumps GA-7007A & GA-7007B, hence new line number 1"-P-7500069-A1A is routed to connect at suction lines of Pumps by Hot Joint (HJ-16, HJ-17). Refer P&ID Number : 750-20005-P-PID-1064.

#### 57) HOT JOINT (HT-35A, HJ-35B) (IN PETRONET AREA)

**Activity:** New Drain line number 4"-P-10-1154-A1A from Pig receiver to be routed all along to nearby existing header line number 4"-BD-10-1158-A1A by Hot Joint (HJ-35A, HJ-35B). Refer P&ID Number : 750-20005-P-PID-1065.

#### 58) NEW STADIS-450 (FA-75001) TANK & LUBRICITY (FA-75002) TANK (GA-M-75003 : DOSING PUMP) (NEAR WHITE OIL PUMP HOUSE)

**Activity:** As per process requirement new Stadis-450, Lubricity Tank 7 Dosing Pump will be accommodated outside of White Oil Pump House towards South side & in between White Oil Pump House Shed and CBD Tank (U/G). The lines from both Stadis-450 & Lubricity tank will be tapped to new pump suction line number 16"-P-7500006-A1A. Refer P&ID Number : 750-20005-P-PID-1061.





Title : CONSTRUCTION TENDER

Project No. : JBGD20005

Doc. No.: - 750-20005-GEN-L-DOC-0001

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**59) NEW PUMP (GA-75001) & CATRIDGE FILTER (FD-75001) (NEAR WHITE OIL PUMP HOUSE)**

**Activity:** As per process requirement new Pump GA-75001 along with Cartridge Filter connected to existing Suction Line Number 16"-P-4703457M-A1A with new line Number 16"-P-7500006-A1A & also connected to existing discharge header Line Number 12"-P-A10028-A1A with new line number 12"-P-7500010-A1A. Refer P&ID Number : 750-20005-P-PID-1061.























































































































UB2	25	WASHER FOR U-BOLT
UB2	25	FIXED SUPPORT UB2-1
UB2	25	WEDGE FOR U-BOLT
UB2	25	WASHER FOR U-BOLT
UB2	25	FIXED SUPPORT UB2-1
UB2	25	WEDGE FOR U-BOLT
UB2	25	WASHER FOR U-BOLT
UB2	25	FIXED SUPPORT UB2-1
UB2	25	WEDGE FOR U-BOLT
UB2	25	WASHER FOR U-BOLT
UB2	25	FIXED SUPPORT UB2-1
UB2	25	WEDGE FOR U-BOLT
UB2	25	WASHER FOR U-BOLT
UB2	25	FIXED SUPPORT UB2-1
UB2	25	WEDGE FOR U-BOLT
UB2	25	WASHER FOR U-BOLT
UB1	20	GUIDE SUPPORT UB1-0.75-(3)
UB1	20	WEDGE FOR U-BOLT
UB1	20	WASHER FOR U-BOLT
UB1	20	GUIDE SUPPORT UB1-0.75-(3)
UB1	20	WEDGE FOR U-BOLT
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UB1	20	GUIDE SUPPORT UB1-0.75-(3)
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UB1	20	WEDGE FOR U-BOLT
UB1	20	WASHER FOR U-BOLT
UB1	20	GUIDE SUPPORT UB1-0.75-(3)
UB1	20	WEDGE FOR U-BOLT
UB1	20	WASHER FOR U-BOLT
UB2	20	FIXED SUPPORT UB2-0.75
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UB2	20	WASHER FOR U-BOLT
UB2	20	FIXED SUPPORT UB2-0.75
UB2	20	WEDGE FOR U-BOLT
UB2	20	WASHER FOR U-BOLT









































Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Plate	70	70	10	7850	2	CARBON STEEL	0.77
PAD	140	3	100	2200	2	PTFE	0.18
Plate	70	70	10	7850	2	CARBON STEEL	0.77
PAD	140	3	100	2200	2	PTFE	0.18
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Rod	400	-	12	7850	1	CARBON STEEL	0.36
Steel	ISA 75x75x8	-	280	8.9	2	A36	4.98
Steel	ISMC 75	-	252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75	-	252	7.14	2	A36	3.60

































Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75		252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75		252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75		252	7.14	2	A36	3.60
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		70	7.14	2	A36	1.00
Plate	70	70	10	7850	2	CARBON STEEL	0.77
PAD	140	3	100	2200	2	PTFE	0.18
Plate	60	50	60	7850	2	CARBON STEEL	2.83
Plate	70	70	10	7850	2	CARBON STEEL	0.77
PAD	140	3	100	2200	2	PTFE	0.18
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	ISMC 75		70	7.14	2	A36	1.00
Steel	/150x75x15kg/m		471.97	15	1	A36	7.08
Steel	/150x75x15kg/m		585	15	1	A36	8.78
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/100x50x8.9kg/m		1220	8.9	1	A36	10.86
steel	/100x50x8.9kg/m		400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m		400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	IS 2062	45.22
Steel	/150x75x15kg/m		721.97	15	1	A36	10.83
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		1010	15	1	A36	15.15
Steel	/150x75x15kg/m		800	15	1	A36	12.00
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		668.32	15	1	A36	10.02
Steel	/150x75x15kg/m		500	15	1	A36	7.50
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		668.32	15	1	A36	10.02
Steel	/150x75x15kg/m		500	15	1	A36	7.50
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/150x75x15kg/m		1318.32	15	1	A36	19.77
Steel	/150x75x15kg/m		500	15	1	A36	7.50
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/250x30.2kg/m		1268.32	30.2	1	A36	38.30
Steel	/250x30.2kg/m		500	30.2	1	A36	15.10
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/250x30.2kg/m		1268.32	30.2	1	A36	38.30
Steel	/250x30.2kg/m		600	30.2	1	A36	18.12
Steel	/250x30.2kg/m		730	30.2	1	A36	22.05
Steel	/250x30.2kg/m		730	30.2	1	A36	22.05
Steel	/250x30.2kg/m		594.32	30.2	1	A36	17.95
Steel	/250x30.2kg/m		1000	30.2	1	A36	30.20
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/250x30.2kg/m		594.32	30.2	1	A36	17.95
Steel	/250x30.2kg/m		1000	30.2	1	A36	30.20
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/250x30.2kg/m		606.32	30.2	1	A36	18.31
Steel	/250x30.2kg/m		1000	30.2	1	A36	30.20
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/350x140x52kg/m		465.32	52	1	A36	24.20
Steel	/350x140x52kg/m		1070	52	1	A36	55.64
Plate	600	12	400	7850	1	IS 2062	22.61
Steel	/250x30.2kg/m		866.3	30.2	1	A36	26.16















Steel	/350x140x52kg/m		1000	52	1	A36	52.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		1784.9	52	1	A36	92.81
Steel	/350x140x52kg/m		1000	52	1	A36	52.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m		701	15	1	A36	10.52
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m		900	15	1	A36	13.50
Steel	/150x75x15kg/m		701	15	1	A36	10.52
Steel	/150x75x15kg/m		931.35	15	1	A36	13.97
Steel	/150x75x15kg/m		400	15	1	A36	6.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1678	58	1	A36	97.32
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1678	58	1	A36	97.32
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m		668.32	15	1	A36	10.02
Steel	/150x75x15kg/m		500	15	1	A36	7.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		1910	52	1	A36	99.32
Steel	/350x140x52kg/m		500	52	1	A36	26.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		2957	52	1	A36	153.76
Steel	/350x140x52kg/m		500	52	1	A36	26.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		1910	52	1	A36	99.32
Steel	/350x140x52kg/m		500	52	1	A36	26.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		607	58	1	A36	35.21
Steel	/400x58kg/m		900	58	1	A36	52.20
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1679	58	1	A36	97.38
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1679	58	1	A36	97.38
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1679	58	1	A36	97.38
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1679	58	1	A36	97.38
Steel	/400x58kg/m		1200	58	1	A36	69.60
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		866	58	1	A36	50.23
Steel	/400x58kg/m		1400	58	1	A36	81.20
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		866	58	1	A36	50.23
Steel	/400x58kg/m		1400	58	1	A36	81.20
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		1426	58	1	A36	82.71
Steel	/400x58kg/m		500	58	1	A36	29.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m		1944	15	1	A36	29.16
Steel	/150x75x15kg/m		1700	15	1	A36	25.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/400x58kg/m		2070	58	1	A36	120.06
Steel	/400x58kg/m		866	58	1	A36	50.23
Steel	/400x58kg/m		866	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		866	58	1	A36	50.23
Steel	/400x58kg/m		866	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		866	58	1	A36	50.23
Steel	/400x58kg/m		866	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Steel	/400x58kg/m		865.999	58	1	A36	50.23
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/400x58kg/m		2220	58	1	A36	128.76





Steel	/200x24.2kg/m		1183	24.2	1	A36	28.63
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		866	24.2	1	A36	20.96
Steel	/200x24.2kg/m		1125	24.2	1	A36	27.23
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		866	24.2	1	A36	20.96
Steel	/200x24.2kg/m		1183	24.2	1	A36	28.63
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		866	24.2	1	A36	20.96
Steel	/200x24.2kg/m		1125	24.2	1	A36	27.23
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		866	24.2	1	A36	20.96
Steel	/200x24.2kg/m		1183	24.2	1	A36	28.63
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		866	24.2	1	A36	20.96
Steel	/200x24.2kg/m		1125	24.2	1	A36	27.23
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		1770	24.2	1	A36	42.83
Steel	/200x24.2kg/m		508.184	24.2	1	A36	12.30
Steel	/200x24.2kg/m		508.184	24.2	1	A36	12.30
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m		1770	24.2	1	A36	42.83
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m		1770	24.2	1	A36	42.83
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m		1770	24.2	1	A36	42.83
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Steel	/200x24.2kg/m		508.185	24.2	1	A36	12.30
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m		510	24.2	1	A36	12.34
Steel	/200x24.2kg/m		500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		428.7	52	1	A36	22.29
Steel	/350x140x52kg/m		500	52	1	A36	26.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		428.7	52	1	A36	22.29
Steel	/350x140x52kg/m		500	52	1	A36	26.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/350x140x52kg/m		428.7	52	1	A36	22.29
Steel	/300x140x46kg/m		500	46	1	A36	23.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		428.7	46	1	A36	19.72
Steel	/300x140x46kg/m		500	46	1	A36	23.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		428.7	46	1	A36	19.72
Steel	/300x140x46kg/m		500	46	1	A36	23.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		428.7	46	1	A36	19.72
Steel	/300x140x46kg/m		500	46	1	A36	23.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		428.7	46	1	A36	19.72
Steel	/300x140x46kg/m		500	46	1	A36	23.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		630	46	1	A36	28.98
Steel	/300x140x46kg/m		900	46	1	A36	41.40
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		630	46	1	A36	28.98
Steel	/300x140x46kg/m		900	46	1	A36	41.40
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		630	46	1	A36	28.98
Steel	/300x140x46kg/m		1226.2	46	1	A36	56.41
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m		137.5	8.9	1	A36	1.22
Steel	/100x50x8.9kg/m		300	8.9	1	A36	2.67
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		552	24.2	1	A36	13.36
Steel	/200x24.2kg/m		500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m		552	24.2	1	A36	13.36
Steel	/200x24.2kg/m		500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/300x140x46kg/m		1620	46	1	A36	74.52
Steel	/300x140x46kg/m		438.7	46	1	A36	20.18
Steel	/300x140x46kg/m		438.7	46	1	A36	20.18
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/300x140x46kg/m		1620	46	1	A36	74.52
Steel	/300x140x46kg/m		438.7	46	1	A36	20.18
Steel	/300x140x46kg/m		438.7	46	1	A36	20.18
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/50x50x6.0		1120	4.47	1	A36	5.01

Steel	/50x50x6.0	-	490	4.47	1	A36	2.19
steel	/50x50x6.0	-	490	4.47	1	A36	2.19
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/75x75x8.0	-	1170	8.9	1	A36	10.41
Steel	/75x75x8.0	-	490	8.9	1	A36	4.36
steel	/75x75x8.0	-	490	8.9	1	A36	4.36
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/100x50x8.9kg/m	-	1220	8.9	1	A36	10.86
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m	-	1420	24.2	1	A36	34.36
Steel	/200x24.2kg/m	-	300	24.2	1	A36	7.26
Steel	/200x24.2kg/m	-	300	24.2	1	A36	7.26
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/100x50x8.9kg/m	-	1220	8.9	1	A36	10.86
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/100x50x8.9kg/m	-	1220	8.9	1	A36	10.86
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/100x50x8.9kg/m	-	1220	8.9	1	A36	10.86
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/100x50x8.9kg/m	-	1220	8.9	1	A36	10.86
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/50x50x6.0	-	1120	4.47	1	A36	5.01
Steel	/50x50x6.0	-	490	4.47	1	A36	2.19
steel	/50x50x6.0	-	490	4.47	1	A36	2.19
Plate	600	12	400	7850	2	S 2062	45.22
Steel	/200x24.2kg/m	-	911	24.2	1	A36	22.05
Steel	/200x24.2kg/m	-	300	24.2	1	A36	7.26
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	806	15	1	A36	12.09
Steel	/150x75x15kg/m	-	300	15	1	A36	4.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	752	24.2	1	A36	18.20
Steel	/200x24.2kg/m	-	1200	24.2	1	A36	29.04
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	806	15	1	A36	12.09
Steel	/150x75x15kg/m	-	300	15	1	A36	4.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	802	15	1	A36	12.03
Steel	/150x75x15kg/m	-	600	15	1	A36	9.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	802	15	1	A36	12.03
Steel	/150x75x15kg/m	-	400	15	1	A36	6.00
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	806	15	1	A36	12.09
Steel	/150x75x15kg/m	-	300	15	1	A36	4.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	734.5	24.2	1	A36	17.77
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	2185.7	24.2	1	A36	52.89
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	2185	24.2	1	A36	52.88
Steel	/200x24.2kg/m	-	1250	24.2	1	A36	30.25
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	2185	24.2	1	A36	52.88
Steel	/200x24.2kg/m	-	1250	24.2	1	A36	30.25
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Steel	/300x140x46kg/m	-	626.53	46	1	A36	28.82
Steel	/300x140x46kg/m	-	660	46	1	A36	30.36
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	384	8.9	1	A36	3.42
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	390	8.9	1	A36	3.47
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	400	8.9	1	A36	3.56
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	390	8.9	1	A36	3.47
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	390	8.9	1	A36	3.47

Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/50x50x6.0	-	490	4.47	1	A36	2.19
Steel	/50x50x6.0	-	200	4.47	1	A36	0.89
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/50x50x6.0	-	490	4.47	1	A36	2.19
Steel	/50x50x6.0	-	200	4.47	1	A36	0.89
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/50x50x6.0	-	490	4.47	1	A36	2.19
Steel	/50x50x6.0	-	200	4.47	1	A36	0.89
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	380	8.9	1	A36	3.38
Steel	/100x50x8.9kg/m	-	500	8.9	1	A36	4.45
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	380	8.9	1	A36	3.47
Steel	/100x50x8.9kg/m	-	500	8.9	1	A36	4.45
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	380	8.9	1	A36	3.38
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/100x50x8.9kg/m	-	390	8.9	1	A36	3.47
Steel	/100x50x8.9kg/m	-	750	8.9	1	A36	6.68
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	408	24.2	1	A36	9.87
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	408	24.2	1	A36	9.87
Steel	/200x24.2kg/m	-	500	24.2	1	A36	12.10
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	1253	24.2	1	A36	30.32
Steel	/200x24.2kg/m	-	624	24.2	1	A36	15.10
Steel	/200x24.2kg/m	-	650	24.2	1	A36	15.73
Steel	/200x24.2kg/m	-	650	24.2	1	A36	15.73
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/200x24.2kg/m	-	280	24.2	1	A36	6.78
Steel	/200x24.2kg/m	-	900	24.2	1	A36	21.78
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	228	15	1	A36	3.42
Steel	/150x75x15kg/m	-	500	15	1	A36	7.50
Plate	600	12	400	7850	1	S 2062	22.61
Steel	/150x75x15kg/m	-	1025	15	1	A36	15.38
Steel	/150x75x15kg/m	-	862	15	1	A36	12.93
Steel	/150x75x15kg/m	-	1025	15	1	A36	15.38
Steel	/150x75x15kg/m	-	862	15	1	A36	12.93
Steel	/150x75x15kg/m	-	1000	15	1	A36	15.00
Steel	/150x75x15kg/m	-	862	15	1	A36	12.93
Steel	/150x75x15kg/m	-	1000	15	1	A36	15.00
Steel	/150x75x15kg/m	-	862	15	1	A36	12.93
Steel	/150x75x15kg/m	-	1645	15	1	A36	24.68





















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Project	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>						
Document Title	<b>WELDING SPECIFICATION FOR FABRICATION OF PIPING</b>				Location:	<b>MANGALORE</b>	
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A4	JBGD20005					1 OF 16	

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### Abbreviations:

**ASNT** American Society for Nondestructive Testing  
**AWS** American Welding Society  
**AUT** Automated Ultrasonic Testing  
**BPVC** Boiler & Pressure Vessel Code  
**CFH** Cubic Feet per Hour  
**DWDI** Double Wall Double Image  
**DWSI** Double Wall Single Image  
**GTA** Gas Tungsten Arc  
**GTAW** Gas Tungsten Arc Welding  
**IBR** Indian Boiler Regulations  
**IQI** Image Quality Indicator  
**NOT** Non Destructive Testing  
**PQR** Procedure Qualification Record  
**RT** Radiographic Testing  
**SMAW** Shielded Metal Arc Welding  
**SWSI** Single Wall Single Image

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## UTS Ultimate Tensile Strength

### 1.0 SCOPE

This specification shall be followed for the fabrication of all types of welded joints of piping system within the battery limits of the plant. This specification shall be used in conjunction with Welding Specification Charts.

The welded pipe joints shall include the following:

- a) All pipe joints, longitudinal butt welds, circumferential butt welds and socket welds.
- b) Attachments of forgings, flanges and other supports to pipes.
- c) Welded manifold headers and other sub-assemblies.
- d) Welded branch connections with or without reinforcing pads.
- e) Joints in welded/fabricated piping components.
- f) The attachments of smaller connections for vents, drain drips and other instrument tappings.

Any approval granted by the Engineer-in-Charge or Owner's inspector, shall not relieve the Contractor of his responsibilities and guarantee.

This specification shall not be applicable for welding of pipelines for transportation of liquid petroleum, gas and other similar products in on shore and off shore.

### 2.0 CODES & STANDARDS

All welding work, equipments for welding, heat treatment, other auxiliary functions and the welding personnel shall meet the requirements of the latest editions of the following accepted standards and procedures unless otherwise specified in the Welding Specification Chart and the Technical Notes attached thereof. In the case of conflicting requirements, the requirements mentioned in Welding Specification Chart/Technical Notes shall be applicable.

- i) ASME B31.3: Process Piping, ASME Code for Pressure Piping, B31
- ii) ASME Boiler & Pressure Vessel Code, Sec II Part C: Specifications for Welding Rods, Electrodes and Filler metals.
- iii) ASME Boiler & Pressure Vessel Code, Section V: Nondestructive examination.
- iv) ASME Boiler & Pressure Vessel Code, Section IX: Welding and Brazing Qualifications.
- v) The Indian Boiler Regulations I.B.R.
- vi) Standard Specification for Non-Destructive Examination Requirements of Piping.
- vii) Welding Specification charts for Piping Classes.

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viii) API 582: Welding Guidelines for the Chemical, Oil, and Gas Industries.

In the event of any differences due to the additional requirements mentioned in this specification, over and above those obligatory as per codes, this specification shall be binding

### **3.0 BASE METAL**

- 3.1 In general, use of carbon steel, alloy steel and stainless steel is envisaged. The details of the material specifications are given in the Welding Specification Chart.
- 3.2 The Contractor shall provide the manufacturer's test certificates for every batch of the materials supplied by him.

### **4.0 WELDING CONSUMABLES**

- 4.1 The Contractor shall provide, at his own expense, all the welding consumables necessary for the execution of the job such as electrodes, filler wires, argon etc. and these should bear the approval of the Engineer-in-Charge.
- 4.2 The welding electrodes and filler wires supplied by the Contractor shall conform to the class specified in the Welding Specification Chart. The materials shall be of the make approved by the Engineer-in-Charge.
- 4.3 Electrode qualification test records should be submitted as per the Exhibit-A (attached) in respect of the electrodes tested by the Contractor, for obtaining the approval of the Engineer-in-Charge. It shall record the minimum test results required for classification of welding consumables as per ASME Section II part C.
- 4.4 The Contractor shall submit batch test certificates from the electrode manufacturers.
- 4.5 All electrodes shall be purchased in sealed containers and stored properly to prevent deterioration. The electrodes removed from the containers shall be kept in baking ovens at temperatures recommended by the electrode manufacturer. "Out of the oven time" of electrodes, before they are consumed, shall not exceed the limits recommended by the electrode manufacturer. The electrodes shall be handled with care to avoid any damage to the flux covering.
- 4.6 All low hydrogen type of electrodes and others, shall be baked as per manufacturers recommendation and stored in holding ovens at temperature recommended by the manufacturer.
- 4.7 The electrodes, filler wires and flux used shall be free from rust, oil, grease, earth and other foreign matter which affect the quality of welding.

### **5.0 SHIELDING & PURGING GAS**

- 5.1 Argon gas used in GTA welding for shielding purposes shall be minimum 99.995% pure. The purity of the gas shall be certified by the manufacturer. The rate of flow for shielding purposes shall be established through procedure qualification tests.

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- 5.2 Argon gas with a purity level of minimum 99.995% shall be used for purging.
- 5.3 When GTAW process alone or a combination of GTA W and SMA W processes is recommended for the production of a particular joint, the purging shall be maintained during the root pass and for the first filling pass to minimize oxidation on the inner side of the pipe, unless otherwise specified in Welding Specification Chart.
- 5.4 Initial purging shall be maintained for sufficient period of time so that at least 4-5 times the volume between the dams is displaced, in order to completely remove the entrapped air. In no case should the initial purging period be less than 10 minutes. High gas pressure should be avoided.
- 5.5 After initial purging, the flow of the backing gas should be reduced to a point where only a slight positive pressure prevails.
- 5.6 Gas backing (purging) is not required for socket type of welded joints.
- 5.7 Dams, used for conserving inert gas during purging, shall be removed after completion of the welding, and shall be accounted for. Wherever, removal of dams is not possible after welding, use of water-soluble dams should be made

## **6.0 EQUIPMENTS & ACCESSORIES**

- 6.1 All the equipment for performing the heat treatment, including transformers, thermocouples, pyro-meters, automatic temperature recorders (with suitable calibration arrangement etc.) shall be provided by the Contractor at his own expense along with certificate traceable to national /international standard.
- 6.2 Contractor shall make necessary arrangements at his own expense, for providing the radiographic equipments, radiographic films, processing equipment all other darkroom facilities and all the equipments/materials required for carrying out the dye-penetrant/magnetic particle test/ultrasonic testing.

## **7.0 WELDING PROCESS**

- 7.1 The welding processes to be employed are given in the Welding Specification Chart.
- 7.2 In addition to Shielded Metal Arc Welding Process (SMAW) and Gas Tungsten Arc Welding Process (GTA W), Welding of various materials under this specification may be carried out using one or more of the following processes with the approval of the Engineer-in-Charge.
- Gas Metal Arc Welding (GMAW)  
Flux Cored Arc Welding (FCAW)  
Submerged Arc Welding (SAW)
- 7.3 The Welding procedure could be employed for a particular joint only after duly qualifying the welding procedure to be adopted.

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## 8.0 EDGE PREPARATION

### 8.1 General

The edges to be welded shall be prepared to meet the joint design requirements by any of the following methods recommended:

- (a) Carbon Steel Gas cutting, machining or grinding methods shall be used. After gas cutting, oxides shall be removed by chipping or grinding.
- (b) Low Alloy Steels (containing up to 5% Chromium). Gas cutting, machining or grinding methods shall be used. After gas cutting, machining or grinding shall be carried out on the cut surface.
- (c) High alloy steel (> 5% Chromium) and stainless steels, nickel alloys:  
Plasma cutting, machining or grinding methods shall be used. After plasma cutting, cut surfaces shall be machined or ground smooth.

### 8.2 Cleaning

(a) The ends to be welded shall be properly cleaned to remove paint, oil, grease, rust, oxides, sand, earth and other foreign matter. The ends shall be completely dry before the welding commences.

(b) On completion of each run, craters, welding irregularities, slag etc., shall be removed by grinding and chiseling. Wire brushes used for cleaning stainless steel joints shall have stainless steel wires and the grinding wheels used for grinding stainless steel shall be of a suitable type. Separate grinding wheels and wire brushes should be used for carbon steels and stainless steels.

## 9.0 ALIGNMENT & SPACING

9.1 Components to be welded shall be aligned and spaced as per the requirements laid down in applicable code. Special care must be taken to ensure proper fitting and alignment when the welding is performed by GTAW process. Flame heating for adjustment and correction of ends is not permitted unless specifically approved by the Engineer-in-Charge.

9.2 A wire spacer of suitable diameter may be used for maintaining the weld root opening while tacking, but it must be removed after tack welding and before laying the root bead.

9.3 For pipes of wall thickness 5 mm and above, the ends to be welded shall be secured in position with the aid of couplers, yokes and 'C' clamps, to maintain perfect alignment. Yokes shall be detached after the completion of weld, without causing any surface irregularity. Any irregularity caused on the pipe surface must be suitably repaired to the satisfaction of the Engineer-in-Charge.

9.4 Tack welds, for maintaining the alignment, of pipe joints shall be made only by qualified welders using approved WPS. Since the tack welds become part of the final weldment they shall be executed carefully and shall be free from defects. Defective tack welds must be removed prior to the actual welding of the joints.

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9.5 Tacks should be equally spaced. Minimum number of tacks shall be:

3 tacks - for 2 1/2" and smaller dia. pipes

4 tacks - for 3" to 12" dia. pipes

6 tacks - for 14" and larger dia. pipes

9.6 Welding shall commence only after approval of fit-up by the Engineer-In-Charge.

## 10.0 WEATHER CONDITIONS

10.1 The parts being welded and the welding personnel should be adequately protected from rain and strong winds. In the absence of such a protection no welding shall be carried out.

10.2 During field welding using GTA W process, particular care shall be exercised to prevent any air current affecting the welding process.

## 11.0 WELDING TECHNIQUE

### 11.1 Root Pass

(a) Root pass shall be made with electrodes/filler wires recommended in the welding specification chart. For fillet welding, root welding shall be done with consumables recommended for filler passes. The preferred size of the electrodes is 2.5 mm diameter (12 SWG) but in any case not greater than 3.25 mm (10 SWG).

(b) Upward technique shall be adopted for welding pipe held fixed with its axis horizontal.

(c) The root pass of butt joints should be executed so as to achieve full penetration with complete fusion of the root edges. Weld projection inside the pipe shall be as per applicable code. It shall be limited 3mm max. when the applicable code does not place any restriction.

(d) Any deviation desired from the recommended welding technique and electrodes indicated in the welding specification chart should be adopted only after obtaining express approval of the Engineer-in-Charge.

(e) Welding shall be uninterrupted.

(f) While the welding is in progress care should be taken to avoid any kind of movement of the components, shocks, vibrations and stresses to prevent occurrence of weld cracks.

(g) Peening shall not be used.

### 11.2 Joint Completion

(a) Joint shall be completed using the class of electrodes, recommended in the Welding



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Specification Chart. Size of the electrode shall not exceed 4 mm in diameter for stainless steels and alloy steels used for low temperature applications.

- (b) Two weld beads shall not be started at the same point in different layers.
- (c) Butt joints shall be completed with a cover layer that would affect good fusion at the joint edges and a gradual notch free surface.
- (d) Each weld joint shall have a workmanship like finish. Weld identification work shall be stamped clearly at each joint, just adjacent to the weld. Metal stamping shall not be used on thin pipe having wall thickness less than 3.5mm. Suitable paint shall be used on thin wall pipes for identification.
- (e) Rust preventive/protective painting shall be done after the weld joint has been approved.

### 11.3 Dissimilar Welds

Where welds are to be produced between carbon steels and alloy steels, preheat and post weld heat treatment requirements shall be those specified for corresponding alloy steels and filler wire/electrodes shall correspond to ER70S-2 or E-7016/7018 type. For welds between two dissimilar Cr-Mo low alloy steels, preheat and post weld heat treatments shall be those specified for higher alloy steel and electrodes used shall correspond to those specified for steel of lower alloy content. For carbon steel or alloy steel to stainless welds, use of filler wire/electrodes E/ER-309/ERNiCr-3/E Ni Cr Fe-3/ENiCrMo-3 shall be made. The welding procedure, electrodes/filler wires to be used shall be approved by the Engineer-in-Charge.

## 12.0 HEAT TREATMENT

### 12.1 Preheating

- (a) No welding shall be performed without preheating the joint to 10°C (50°F) when the ambient temperature is below 10 degree.
- (b) Preheating requirements for the various materials shall be as per the Welding Specification Chart
- (c) Preheating shall be performed using resistance or induction heating methods. Preheating by gas burners, utilizing oxy-acetylene or oxy-propane gas mixtures, with neutral flame may also be carried when permitted by the Engineer-in-Charge.
- (d) Preheating shall extend uniformly to at least three times the thickness of the joint, but not less than 25 mm, on each sides of the weld.
- (e) Preheating temperature shall be maintained over the whole length of the joint during welding. Temperature recorders shall be provided by the Contractor to record the temperature during alloy steel welding. For carbon steel piping, preheat temperature shall be ensured by use of temperature indicating crayons, pyrometers or other suitable means.

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In case of alloy steel materials such as Cr-Mo steels, if the post weld heat treatment is not performed immediately after welding, the weld joint and adjacent portion of pipe, at least 50 mm on either side of weld, shall be uniformly heated to 300°C. This temperature shall be maintained for half an hour minimum, and then wrapped with mineral wool before allowing it to cool to room temperature. If the Post Heating temperature specified in the Welding Specification Charts exceeds 300°C, the same shall be followed. Similarly, if the welding specification chart specifies post-heat time, the same shall be applicable. Post weld heat treatment as specified in the Welding Specification Chart shall be carried out later on.

### 12.3 Post Weld Heat Treatment (PWHT)

(a) Post weld heat treatment, wherever required for joints between pipes, pipes and fittings, pipe body and supports shall be carried out as per the welding specification chart, applicable codes standards and the instructions of the Engineer-in-Charge. In this regard procedure qualification to be done before carrying out PWHT in production welds

(b) The Contractor shall submit for the approval of the Engineer-in-Charge, well before carrying out actual heat treatment, the details of the post weld heat treatment procedure as per Exhibit B attached, that he proposes to adopt for each of the materials/assembly/part involved.

(c) Post weld heat treatment shall be done in a furnace or by using an electric resistance or induction-heating equipment, as decided by the Engineer-in-Charge.

(d) While carrying out local post weld heat treatment, technique of application of heat must ensure uniform temperature attainment at all points of the portion being heat-treated. Care shall be taken to ensure that width of heated band over which specified post weld heat treatment temperature attained is at least that specified in the relevant applicable standards/codes. Control of temperature shall be done using microprocessor/computer controlled system. The desired time-temperature cycle shall be entered into the microprocessor/computer.

(e) Throughout the cycle of heat treatment, the portion outside the heated band shall be suitably wrapped under insulation so as to avoid any harmful temperature gradient at the exposed surface of pipe. For this purpose temperature at the exposed surface should not be allowed to exceed 50% of the peak temperature.

(f) The temperature attained by the portion under heat treatment shall be recorded by means of thermocouple pyrometers. Adequate number of thermocouples should be attached to the pipe directly at equally spaced location along the periphery of the pipe joint. The minimum number of thermocouples attached per joint shall be 1 up to 6" dia., 2 up to 10" dia. and 3 for 12" dia. and above. However, the Engineer-in-Charge can increase the required number of thermocouples to be attached if found necessary.

(g) Automatic temperature recorders, which have been suitably calibrated, shall be employed for measuring & recording temperature. The time-temp graph shall be submitted to Engineer-in-Charge immediately on completion of Stress Relieving Cycle. The calibration record of each recorder should be submitted to the Engineer-in-Charge prior to starting the heat treatment operations and his approval should be obtained.

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(h) Manufacturer's test certificate shall be submitted for the thermocouples materials and record shall be maintained by the Contractor.

(i) Immediately on completion of the Heat Treatment, the Post Weld Heat Treatment charts/records along with the hardness test results on the weld points, wherever required as per the Welding Specification Chart, shall be submitted to Engineer-in- Charge for his approval.

G) Each weld joint shall bear a unique identification number, which shall be maintained in the piping sketch to be prepared by the Contractor. The weld joint identification number should appear on the corresponding post weld heat treatment charts. The chart containing the identification numbers and piping sketch shall be submitted to the Engineer-in-Charge in suitable folders.

### **13.0 CLEANING OF THE WELD JOINT**

All weld joints shall be free from adherent weld spatters slag, swarf, dirt or foreign matter. This can be achieved by brushing. For stainless steels, brushes with only stainless steel bristles shall be used.

### **14.0 INSPECTION AND TESTING**

#### **14.1 General**

(a) The Owner's inspector shall have free access to all concerned areas, where the actual work is being performed. The contractor shall also accord the Owner's Inspector all means and facilities necessary to carry out inspection.

(b) The Owner is entitled to depute his own inspector to the shop or field where prefabrication and erection of pipe lines is in progress for (but not limited to) the following objectives:

- i) To check the conformance to relevant standards and suitability of various welding equipments and the welding performance.
- ii) To witness:- the welding procedure qualification.
- iii) To witness the welder performance qualification.
- iv) To check whether shop/field welding being executed is in conformity with the relevant specifications and codes of practice followed in piping construction.

(c) Contractor shall intimate sufficiently in advance the commencement of qualification tests, welding works and acceptance tests, to enable the Owner's inspector to be present to supervise them, as decided by the Engineer-In-Charge.

#### **14.2 Welding Procedure Qualification**

Welding procedure qualification shall be carried out in accordance with the applicable requirements of ASME Sec. IX latest edition and/or other applicable codes and the job requirements. The contractor shall submit the welding procedure specification in format as per Exhibit-C (attached) immediately after the receipt of the order. Owner's inspector will review, check and approve the welding procedure submitted and shall release the procedure for

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qualification tests. The procedure qualification test shall be carried out by the Contractor at his own expense. A complete set of test results in the format as per Exhibit-0 attached) shall be submitted to the Owner's inspector for his approval immediately after completing the procedure qualification test and at least 2 weeks before the commencement of actual work. Standard test as specified in the code shall be carried out in all cases. In addition to these tests, other tests like macro/micro examination, hardness tests, dye penetrant examination, charpy V- notch, Corrosion tests, impact tests etc. shall be carried out on specimens depending upon the type of base material, operating conditions and requirements laid down in the detailed drawings and specifications. It shall be the responsibility of the Contractor to carry out all the tests required to the satisfaction of the Owner's inspector.

#### 14.3 Welder's Qualification

(a) Welders shall be qualified in accordance with the ASME Section-IX or other applicable codes. The Owners inspector reserves the right to witness the test and certify/approve the qualification of each welder separately. Only those welders who have been approved by the Owner's Inspector shall be employed for welding. Contractor shall submit the welder qualification test reports in the format as per Exhibit-E (attached) and obtain express approval before commencement of work. It shall be the responsibility of Contractor to carry out qualification tests of welders. For welding of the steam piping, falling under the purview of Indian Boiler Regulations, only those welders with IBR Certification, qualified by Boiler Inspectorate, and acceptable to the local Boiler Inspector authority shall be employed.

(b) The welders shall always have in their possession, an identification card containing information contained in Exhibit-G and shall produce it on demand by the Engineer- In-Charge or his representative. It shall be the responsibility of the Contractor to issue the identify cards after it has been duly certified by the, owner 's Inspector.

(c) No welder shall be permitted to work without the possession of the identify card.

(d) If a welder is found to perform a type of welding or in a position for which he is not qualified, he shall be debarred from doing any further work. All welds performed by an unqualified welder shall be cut and redone by a qualified welder at the expense of the Contractor

#### 14.4 Visual Examination

Visual Examination of all welds shall be carried out as per the latest editions of the applicable codes and specifications. All finished welds shall be visually inspected for parallel and axial alignment of the work, excessive reinforcement, concavity of welds, shrinkage cracks, inadequate penetration, unrepaired bum-through, under cuts, dimensions of the weld, surface porosity and other surface defects. Undercutting adjacent to the completed weld shall not exceed the limits specified in the applicable standard/code.

#### 14.5 Radiographic Examination

(a) The Radiographic Examination procedures to be adopted shall be submitted by the contractor as per Exhibit-F and shall be got approved from the Owner's Inspector prior to employment. A person qualified to ASNT Level-11 or ASNT Level-III in Radiographic testing

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shall prepare the procedure. The Radiography Procedure shall be established to demonstrate that the required sensitivity can be consistently achieved under the most unfavourable parameters (e.g. source to film distance, geometric unsharpness, thickness etc.). The radiographic technique and procedure adopted shall conform of the requirements mentioned in Article 2 as well as Article 22 of ASME Sec.V. The IQI sensitivity obtained shall be equal to or better than the requirements mentioned in Article 2 of ASME Sec.V. Source side penetrometer shall be used in establishing radiographic procedure/ technique. The acceptance criteria shall be as per the relevant codes of Fabrication and over riding requirements if mentioned else where in the technical specifications of the contract. The Contractor shall be responsible for carrying out Radiography; rectification of defects and re-radiography of welds repaired/rectified at his cost.

(b) The extent of Radiography shall be as per specifications to be supplied to the Contractor. For welds between dissimilar materials, the extent of Radiographic Examination shall be the more stringent of the two recommended for the materials being welded. Wherever random Radiography is called for, in a particular piping class, the dissimilar materials weld joints shall essentially be included.

(c) Type of Radiation source and film to be used shall be as per Exhibit-H for carrying out radiographic examination. However if specifications (as given else where in the contract) for some critical material require usage of X-Radiation, then Radiography shall be done using X-Rays only.

(d) The Contractor shall fulfill all the statutory and owner's safety requirements while handling X-ray and Gamma-ray equipments.

(e) In case of random radiography, the joints for Radiography shall be selected by the Owner's Inspector and the Radiography shall be performed in his presence, if he instructs the contractor to do so. The contractor shall furnish all the radiographs, to the Owner's Inspector immediately after processing along with evaluation by a person qualified to ASNT Level-11 in Radiographic testing, inline with Article 2 of ASME Sec.V. The certificate of ASNT/ISNT Level II qualification of the NDT personnel shall be submitted to owner's inspector for his approval prior to start of job.

(f) The Contractor shall provide the Owner's Inspector, all the necessary facilities at site such as a dark room with controlled temperature, illuminator (viewer) suitable for varying densities, a duly calibrated electronic densitometer with batteries, magnifying glass, tracing papers, ruler, marking pencils etc. to enable him to review the radiographs.

(g) Where random radiography is specified, the first weld of each welder shall be completely radiographed. In the case of pipe of size 6" and below, the first two welds shall be completely radiographed.

(h) For each weld performed by a welder found unacceptable, two additional checks shall be carried out on welds performed by the same welder. This operation is iterative and the of two additional welds for each weld deemed unsatisfactory shall be continued till such time that two consecutive welds of satisfactory quality are found for every defective weld.

(i) The Contractor shall carry out these additional radiographic testing at his own expense. To avoid the possibility of too many defective welds by a single welder remaining undetected for a long period to time, the Contractor shall promptly arrange for Radiographic Examination so that there is no accumulation of defective joints.

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(j) Contractor shall quote rates for X-ray as well as Gamma Ray for joints indicated to be radiographed by X-ray in Table of Exhibit-H.

#### 14.5.1 Check shots

(a) Owner I Engineer-in-charge or his representative shall select 5% of the total joints radiographed on a day for check shots. Contractor shall carry out check shots as directed.

(b) Weld profiles of check shots shall be compared with weld profile observed in the earlier Radiographs. In the event of any one variation in the check shots and earlier Radiographs, contractor shall re-shoot the entire lot of joints radiographed by particular Radiography agency on the particular date. All the re-shot films shall be compared with the originally submitted films.

#### 14.6 Liquid Penetrant and Magnetic Particle Examination

(a) Whenever such tests are specified, the tests shall be carried out on joints chosen by the Owner's inspector, as per ASME Section V article 6 and 7 respectively. The tests are to be performed by a person possessing a valid ASNT/ISNT Level-II qualification in the method being used.

(b) For austenitic stainless steels and other nonmagnetic materials, liquid (dye) penetrant test shall be carried out. For carrying out this test, the materials shall be brought within a temperature limit of 15° to 50°C.

#### 14.7 Automated Ultrasonic examination (AUT)

(a) Automated ultrasonic testing (AUT) can be used in substitution of radiographic examination when permitted by ASME B31.3 code case 181 shall require prior approval of Engineer-in-charge as detailed in EXHIBIT-I.

(b) The automated ultrasonic testing (AUT) procedure to be adopted shall be submitted by the CONTRACTOR as per EXHIBIT-I and get it approved from PMC/OWNER.

(c) The CONTRACTOR shall make all the arrangements for the Automated Ultrasonic Testing of work at his expense. The CONTRACTOR shall furnish all the reports to the PMC/OWNER, immediately after examination together with the corresponding interpretation reports on the approved format. The details of the AUT reports along with the joint identification number shall be duly entered in a register and signed by the CONTRACTOR and submitted to the PMC/OWNER for approval. The PMC/OWNER will review all the Automatic Ultrasonic Testing records of welds and inform the CONTRACTOR to those welds, which are unacceptable. The decision of the COMPANY shall be final and binding in this regard.

(d) In addition, Radiography examination shall be carried out when in the opinion of PMC, /OWNER, Radiography inspection is required to confirm or clarify defects indicated by Automated Ultrasonic examination. Repaired welds and transition spool piece weld joints shall be additionally examined by radiography if it is examined by automated ultrasonic testing.

(e) The automated ultrasonic testing system used for inspecting welds shall be approved by PMC/OWNER.

#### 14.8 Hardness Test



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Hardness requirements for welds shall be as per the Welding Specification Chart/Non Destructive Examination Specification attached elsewhere in the contract. Hardness testing shall be carried out by Vickers Hardness Tester during welding procedure qualification and shall be cross sectional. For production welds, hardness testing shall be carried out by portable digital hardness testers. Poldi hardness tester shall not be permitted. Contractor shall produce documentary evidence/calibration certificate to the Owner's Inspector and obtain approval of the hardness testing equipment.

#### 14.9 Proof Tests

Hydrostatic and pneumatic tests shall be performed as per the requirements laid down by respective flushing and Testing specification/applicable codes to demonstrate the soundness of the welds. The tests shall be conducted after fulfilling the requirement of visual examinations radiography etc., and after the entire work has been certified by the Owner's inspector to be fit for being subjected to such tests.

#### 15.0 REPAIRS OF WELDS

- (a) No repair shall be carried out without prior permission of the Owner's inspector.
- (b) Repairs and/or work of defective welds shall be done in time to avoid difficulties in meeting the construction schedules.
- (c) Defects ascertained through the inspection methods, which are beyond acceptable limits shall be removed after the joint is completely radiographed by the process of chipping and grinding. The repaired welds shall be subjected, as a minimum requirement to the same testing and inspection requirements as the original weld.
- (d) The number of times repair welding can be permitted for the same weld shall be governed by the standard specification, 6-44-0016.
- (e) When the entire joint is judged unacceptable, the welding shall be completely cut and edges suitably prepared as per required alignment tolerances. The rewelded joint shall again be examined following standard practices.

#### 16.0 DOCUMENTS TO BE SUBMITTED BY CONTRACTOR (4 COPIES EACH)

- (a) Electrode and Welding Consumable Qualification Records as per Exhibit-A, for the Welding Consumables tested and approved for the work.
- (b) Batch Test Certificates, for the Electrodes used, obtained from the Electrode Manufacturers.
- (c) Proposed Heat Treatment Procedure as per Exhibit-B. (d) Heat Treatment Charts.
- (e) Weld joint hardness test results.
- (f) Welding Procedure Specifications as per Exhibit-C immediately after receipt of the order.
- (g) Welding Procedure Qualification records as per Exhibit-D.
- (h) Welder Performance Qualification records as per Exhibit-E immediately after conducting Welder Qualification Tests.



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- (i) Radiography Procedure as per Exhibit-F and other NOT procedures.
- G) Radiographic test Report along with Radiographs and other NOT reports.
- (k) Piping Sketch (Isometric) giving all the details regarding the pipe specifications, welded joints, joints radiographed magnetic particle, tested, ultrasonic tested, penetrant tested, joints heat treated, WPS used, welders identification number, etc.



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### EXHIBIT- A: ELECTRODE QUALIFICATION TEST RECORD

Date:

Test started on:

Test completed on:

A: DETAILS

CONTRACTOR

Tested at (Site name)

Code of Reference (used for testing)

Special Requirements (if any)

Sl. No.	Classification of electrode	Size of electrode	Batch no.	Manufacturer name/brand/date of manufacture	Intended for welding in position	Remarks

B : All-weld Tensile Test

Base Material used

Buttering used Yes/No

Pre-heat temperature



Inter-pass temperature

Post weld heat treatment details

Visual examination

Radiographic examination results

Tensile test results

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Sl.No.	Batch no./ identification no.	Size of electrode	Current & polarity	UTS		YS		% elongation		Remarks
				As per code	Actual	As per code	Actual	As per code	Actual	

C. Impact Test Results



Test Temperature

Notch in

Type of Specimens (Charpy)

Size of Specimens

Sl.No.	Batch no./ identification no.	Size of electrode	Current & polarity	Impact value						Average	Remarks
				As per code, max./avg.	1	2	3	4	5		

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D. Chemical Analysis Results

SI.No.	Batch no./ identification no.	Size of electrode	Current & polarity	%											Others	Remarks	
				C	Mn	Si	S	P	Ni	Mo	V						
				As per code													
				Actual													
				As per code													
				Actual													

E. Fillet Weld Test  
Results

Base  
Materials

Sl. No.	Batch no./ identification no.	Size of electrode	Current & polarity	Welding position	Visual	Macro	Fracture	Remarks
				Horizontal				
				Vertical				
				Overhead				
				Horizontal				
				Vertical				
				Overhead				

F. Other Test Results

- Transverse  
tensile test In  
combination  
with Base  
material used  
Position of


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welding Preheat

temperature

Post weld heat treatment

Radiography

-

Identification No.

U.T.S.

Fracture in

Remarks

2. Guided Bend Test

Position	Identification No.	Root, Face or Side Bend	Remarks
	1		
	2		
	3		
	4		
	5		

G. Any other tests

H. Conclusions

PREPARED BY  
(CONTRACTOR)

REVIEWED BY  
(CONTRACTOR)

APPROVED BY  
(PMC/OWNER)



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EXHIBIT-B: STRESS RELIEF HEAT TREATMENT PROCEDURE SPECIFICATION

LSTK CONTRACTOR \_\_\_\_\_

Name of the Heat treater \_\_\_\_\_

Name of the Project \_\_\_\_\_

Specification /Reference No. \_\_\_\_\_

Line no./Joint No. \_\_\_\_\_

<u>1. General Details</u>	<u>Other Details</u>
Name of the Equipment: _____	Type of Heating : Elec. Res./ Induction (Tick mark applicable method)
	Maximum Permissible Temp at Uncovered Parent Metal _____
	Width of heated band _____
	Width of Insulation _____
Material: _____	No. of Thermo couples (dia wise) _____
Type of Thermo couples _____	

3. Heat Treatment Cycle Details

Charging Temp OC \_\_\_\_\_

Rate of heating °C /Hr. \_\_\_\_\_

Soaking Temperature, °C \_\_\_\_\_

Soaking Time, Hrs. \_\_\_\_\_

Rate of Cooling °C /**Hr.** \_\_\_\_\_



Method of Cooling \_\_\_\_\_

4. Other details, if any \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



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**EXHIBIT-C: FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)**

Company Name \_\_\_\_\_ By \_\_\_\_\_

Welding Procedure Specification No. \_\_\_\_\_ Date \_\_\_\_\_ Supporting PQR No. (S) \_\_\_\_\_

Revision No. \_\_\_\_\_ Date \_\_\_\_\_

Welding Process (es) \_\_\_\_\_ Type (s) \_\_\_\_\_  
(Automatic, Manual, Machines or Semi Auto)

**JOINTS**

Joint **Design**-----  
Backing(Yes) \_\_\_\_\_ (No) \_\_\_\_\_

Backing Material (**Type**)-----  
Sketches Production Drawings. Weld Symbols Written

Description should show the general arrangement of the parts to be welded. Where applicable, the root specing and the details of weld groove may be specified.

(At the option of the Manufacturer sketches may be attached to illustrate joint design weld layers and bead sequence e.g. for notch toughness procedures, for multiple process procedures, etc.)

**BASE METALS**

P.No. \_\_\_\_\_ Group No. \_\_\_\_\_ to P. No. \_\_\_\_\_ Group No. \_\_\_\_\_

OR

Specification type and **grade**-----  
to Specification type and grade \_\_\_\_\_

OR

Chern. Analysis and Mech. Prop. -----  
to Chern. Analysis and Mech. Prop. \_\_\_\_\_



Thickness Range :

Base Metal : Groove \_\_\_\_\_ Fillet \_\_\_\_\_



Deposited Weld Metal : Groove \_\_\_\_\_ Fillet \_\_\_\_\_

Pipe Dia Range : Groove : \_\_\_\_\_ Fillet \_\_\_\_\_

Other \_\_\_\_\_

 nauvata ENGINEERING EXCELLENCE	<b>PROJECT : MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	 ONGC एन ओ ए पी एल MRPL
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### FILLER METALS

F.No. \_\_\_\_\_ cnher \_\_\_\_\_  
 A.No. \_\_\_\_\_ Other \_\_\_\_\_  
 Spec. No. (SFA) \_\_\_\_\_  
 AWS No. **(Class)** \_\_\_\_\_  
 Size of filler metals \_\_\_\_\_  
 \_\_\_\_\_  
 (Electrodes, Cold Wire, Hot Wire etc.)

Electrode-Flux **(Class)** \_\_\_\_\_  
 Flux Trade Name \_\_\_\_\_  
 Consumable Inset \_\_\_\_\_  
 Each base metal/filler metal combination should be recorded individually.



WPS NO. \_\_\_\_\_ Rev.

<b>POSITIONS:</b>  Position (s) of Groove _____  Welding Progression :UP ____Down ____  Position (s) of Fillet _____	<b>POSTWELDED HEAT TREATMENT</b>  Temperature Range _____  Time Range _____
<b>PREHEAT</b>  Preheat Temp. Min. _____  Interpass Temp. Max. _____  Preheat Maintenance _____	<b>GAS</b> Shielding Gas (es) _____ Percent Composition (mixtures) _____  Flow Rate _____ Gas Backing _____ Trailing Shielding Gas Composition _____

### ELECTRICAL CHARACTERISTICS

Current AC or DC \_\_\_\_\_ **Polarity** \_\_\_\_\_  
 Amps (Range) \_\_\_\_\_ Volts (Range) \_\_\_\_\_  
 (Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular form similar to that shown below).

Tungsten Electrode Size and **Type** \_\_\_\_\_  
 \_\_\_\_\_ (Pure Tungsten, 2% Ceriated, etc)  
 Mode of Metal Transfer for GMAW \_\_\_\_\_  
 \_\_\_\_\_ (Spray arc, short circuiting arc, etc.)  
 Electrode Wire feed speed range \_\_\_\_\_  
 \_\_\_\_\_

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### TECHNIQUE

String or Weave **Bead**-----

Orifice or Gas Cup **Size**-----

Initial and Interpass Cleaning (Brushing, Grinding, etc.) \_\_\_\_\_

Method of Back **Gouging**-----

Oscillation \_\_\_\_\_

Contact Tube to Work Distance \_\_\_\_\_

Multiple or Single Pass (per side) \_\_\_\_\_

Multiple or Single **Electrodes**-----

Travel Speed (**Range**)-----

Peening \_\_\_\_\_

Other \_\_\_\_\_

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	Travel Speed Range	Others
		Class.	Dia.	Type Polarity	Amp. Ranece			
								e.g. Remarks, Comments, Hot wire Addition, Technique Torch Angle, etc.




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EXHIBIT-D: FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)  
RECORD OF ACTUAL CONDITIONS USED TO WELD TEST COUPON

Company Name \_\_\_\_\_  
 Procedure Qualification Record No. -----Date \_\_\_\_\_  
 WPSNo. \_\_\_\_\_



Welding Process (es) -----  
 Types (Manual, Automatic, **Semi-Auto**)-----

**JOINTS**

Groove Design of Test Coupon

(For combination qualification the deposited weld metal thickness shall be recorded for each Filler metal or process weld)

<b>BASE METALS</b> Material Sepc. _____ Type _____ of _____ Grade P.No. _____ to P.No. _____ Thickness of Test Coupon _____ Diameter of Test Coupon _____ Other _____	<b>POSTWELD HEAT TREATMENT</b> Temperature _____ Time _____ Other _____
<b>FILLER METALS</b> Weld Metal Analysis A No. _____ Size of Filler Metal _____ Filler Metal F.No. _____ SFA _____ Specification AWS _____ Classification Other _____	<b>GAS</b> Type of Gas/Gases _____ Composition of Gas Mixture _____ Other _____
<b>POSITION</b> Position of Groove _____ Weld Progression (Uphill, Downhill) _____ Other _____	<b>ELECTRICAL CHARACTERISTICS</b> Current _____ Polarity _____ Amps. _____ Tungsten Electrode Size _____ Other _____
<b>PREHEAT</b> Preheat Temp. _____ Interpass Temp. _____	<b>TECHNIQUE</b> Travel Speed _____ String or Weave Bead _____ Oscillation _____ Multipass or Single Pass (per side) _____ Single or Multiple Electrodes _____ Other _____

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### TENSILE TEST

Specimen No.	Width	Thickness	Area	Ultimate total force, kgf	Ultimate tensile stress, Kg/mm <sup>2</sup>	Type & location of failure

### GUIDED BEND TESTS

Type of Figure No.	Result



### TOUGHNESS TESTS

Specimen No.	Notch Location	Notch Type	Test Temp.	Impact Value	Lateral Exp.		Drop Weight	
					%Shear	Mils	Break	No Break

### FILLET WELD TEST

Result - Satisfactory : Yes \_\_\_\_\_ No \_\_\_\_\_ Penetration into Parent Metal : Yes \_\_\_\_ No. \_\_\_\_\_

Marco - Results \_\_\_\_\_

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**OTHER TESTS**

Type of Test \_\_\_\_\_

Deposit Analysis -----

Other -----

Welder's Name \_\_\_\_\_ Clock No. \_\_\_\_\_ Stamp No. \_\_\_\_\_

Test Conducted by \_\_\_\_\_ Laboratory Test No. -----

We certify that the statements in this record are correct and test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date \_\_\_\_\_

Manufacturer -----

By \_\_\_\_\_

(Detail of record of tests are illustrative only and may be moulded to conform to the type and number of tests required by codes and specifications).





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**EXHIBIT-E: FORMAT FOR MANUFACTURER'S RECORD FOR WELDER OR WELDING OPERATOR QUALIFICATION TESTS**

Welder Name \_\_\_\_\_ Check No. \_\_\_\_\_ Stamp. No. \_\_\_\_\_

Using WPS No. \_\_\_\_\_ Rev. \_\_\_\_\_

The above welder is qualified for the following ranges

Variable	<u>Record Actual Values</u> Used in Qualification	Qualification Range
Process	_____	_____
Process Type	_____	_____
Backing (metal, Weld metal, flux, etc)	_____	_____
Material Spec.	_____ to _____	_____ to _____
Thickness		
Groove	_____	_____
Fillet	_____	_____
Diameter		
Groove	_____	_____
Fillet	_____	_____
Filler Metal		
Spec. No.	_____	_____
Class	_____	_____
F. No.	_____	_____
Position	_____	_____
Weld Progression	_____	_____
Gas Type	_____	_____
Electrical Characteristics		
Current	_____	_____
Polarity	_____	_____

 <b>nauvata</b> <small>ENGINEERING EXCELLENCE</small>	<b>PROJECT : MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>	 <small>ONGC</small> <small>एन जी सी</small> <small>MRPL</small>
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Guided Bend Test Results

Type and Fig. No.	Result

Radiographic Test Results  
For alternative qualification of groove welds by radiography

Radiographic Results -----

Fillet Weld Test Results

Fracture Test (Describe the location, nature and size of any crack or tearing of the specimen)  
 Length and Per Cent of Defects \_\_\_\_\_ inches \_\_\_\_\_ %

Macro Test - Fusion -----  
 Appearance - Fillet Size (ing) \_\_\_\_\_ x \_\_\_\_\_ Convexity or Concavity \_\_\_\_\_

Test Conducted by \_\_\_\_\_ Laboratory -Test No. \_\_\_\_\_



We certify that the statements in this record are correct and that the test welds were prepared.  
 Welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date -----

Organization \_\_\_\_\_  
 By \_\_\_\_\_

(Details of record tests are illustrative only and may be modified to conformation to the type & number of tests required by the Code).

Note: Any essential variables in addition to those above shall be recorded.

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**EXHIBIT-F: RADIOGRAPHIC PROCEDURE QUALIFICATION  
RECORD FOR PIPE WELDING**

- I. Location
2. Date of Testing
3. Name of the LSTK CONTRACTOR/Agency
4. Material: Carbon steel/AHoy Steel/Stainless Steel
- 4 A. Technique: DWSI/SWSI/DWDI
5. Diameter & Thickness:
6. Type of Weld Joint:
7. Radiation Source:
8. Intensifying Screens/Lead Screens:
9. Geometric Relationship:
10. Limit of Film Coverage:
- II. Film Type and Make:
12. Exposure Time:
13. Processing:
14. Density:
15. Sensitivity:
- 16.\* Type of penetrometer:  
(Source side)
- 17.\* Type of penetrometer:  
(Film side)

Signature of LSTK CONTRACTOR/Agency with Seal

Approval of OWNER/ PMC's Inspector

\* Ref. Para regarding recommended practice on placement of penetrameters Article 22, SE 142, ASME Sec. V.

\* For "Random Radiography" lines placement of penetrameters as per Article 2, ASME, Sec. V is permitted.



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EXHIBIT-G: WELDER'S IDENTIFICATION CARD



Approved by:

Employer's Signature with Seal

EXHIBIT-H: Type of Source and Films to be used for RADIOGRAPHY

NOMINAL WALL THICKNESS (T) IN mm		SHOP WELDED JOINTS		IN-SITU WELDS	
		SOURCE	FILM : CEN Class	SOURCE	FILM : CEN Class
T > 19	All Materials	Gamma Ray	C5	Gamma Ray	C5
8:ST<19	Carbon Steel	Gamma Ray	C4	Gamma Ray	C4
	All other materials	Gamma Ray	C3	Gamma Ray	C3
< 8	Carbon Steel Other than Inspection Class IV*	Gamma Ray	C3	Gamma Ray	C3/C1

	All other materials and Carbon Steel of Inspection Class IV*	X-Ray	C4	X-ray with C4 or Equivalent to be used. Gamma Ray (Se 75 Source only) with C3/C2 Equivalent may be allowed only if in the assessment of the owner's inspector, Joints are inaccessible for X-ray equipment and radiographic sensitivity is achieved.
--	--	-------	----	--

Note: Integral to above table



- I) Films slower than the above may have to be used, if required radiographic sensitivity is not achieved consistently.

\* Piping classes where 100% RT is specified. Refer Std. Spec. No. 6-44-0016

#### COMPARISON OF FILMS FROM DIFFERENT MANUFACTURERS

CEN Classification	KODAK	AGFA	FUJI
---	<b>ex</b>	D8	---
C5	AA400	07	IX100
C4	T200	D5	IX80
C3	MXI25	04	IX50
C2	MIOO	D3	---
C1	DR50	D2	IX25
---	SR**	---	---

\*\* *Special films, extremely fine grain & very high resolution*

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### EXHIBIT-1: AUTOMATED ULTRASONIC TESTING (AUT)

- 1.0 INTRODUCTION
  - 2.0 REFERENCE DOCUMENTS
  - 3.0 AUT SYSTEM
  - 4.0 COUPLANTS
  - 5.0 CALIBRATION/DEMONSTRATION BLOCK
  - 6.0 CALIBRATIONS
  - 7.0 PROCEDURE
  - 8.0 TRAINING AND QUALIFICATION
  - 9.0 EVALUATION AND ACCEPTANCE CRITERA
-

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## 1.0 INTRODUCTION

The specification shall be applicable for Automated Ultrasonic Testing (AUT) system or Semi-Automated Ultrasonic Testing suitable for full penetration butt welds of piping. The system shall incorporate Phased array probes and Time of Flight Diffraction (TOFD) probes plus pulse echo probes. The procedure shall evaluate the performance of Phased Array Ultrasonic examination instruments and system. This specification is intended to be used on thickness of 13.0 mm and greater. Lesser thicknesses may be tested using the standard practice if the technique can be demonstrated to provide adequate protection on mockups of the same wall thickness and geometry.

## 2.0 REFERENCE DOCUMENTS

The latest edition with addendum of the following standards shall be referred here:

- a) ASME 831.3 -Process piping
- b) ASME 831 Case 181-2. 2012 Use of alternative Ultrasonic Examination Acceptance Criteria in ASME 831.3
- c) ASME Section V- Non Destructive Examination (Latest edition)
- d) ASNT SNT-TC-1 A - Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing

## 3.0 AUT SYSTEM

### 3.1 Instrument Requirement

The ultrasonic examination shall be performed using a system employing automated/ semi-automated scanning with computer based data and analysis abilities.

The instrument shall be capable of real-time sectorial scan (also called an S-scan) image during scanning to assure that proper data has been collected, generating and displaying sectorial-scan image, which can be stored and recall for subsequent review.

The system shall provide an adequate number of examination channels to ensure the complete volumetric examination of the weld through the thickness in one circumferential scan.

The evaluation zones should be of maximum 2.0mm height. The instrument linearity should be such that the accuracy is within 5%.



Each examination channel should be selective for pulse-echo or through transmission mode gate position and length for a minimum of two gates and gain.

TOFD techniques & B-scan mapping should be available to improve characterization. Recording thresholds should be selectable to display signals between 0 and 100% of full screen height for simple amplitude and transit time recording and it should be from 0 to 100% for B-scan or mapping type recording of data. Two recordable signals output per gate should be available being either analog or digital and representative of signal height and time of flight. Measuring distance accuracy of circumferential weld shall be within 1.0 em from zero (0) position.

Electronic noise shall be lower than acoustical noise in all channels for the probes and sensitivities to be used during inspection. The signal to noise ratio for each channel during examination shall be at least 2: 20 dB for shear waved probes.

The Contractor shall provide the detail information of the equipment like model, trade name, software used to the OWNER/PMC.



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### 3.2 Probes

The phased array search unit frequency shall be between 1 MHz and 10 MHz depending on material type and thickness. The Contractor shall provide the detail information of the probe frequency, no. of elements, size, pitch etc. to the OWNER/PMC.

### 3.3 Wedge

Phased array wedges shall be of a design to accommodate phased array search unit. Nominal refracted-wedge angles shall be possible from 35 to 75 degrees to ensure 100 % coverage of the weld and heat affected zone. The Contractor shall provide the detail information of the wedge to the OWNER/PMC.

### 3.4 Encoder

The encoder shall be capable of permitting a scan resolution of 1.0mm as minimum.

### 4.0 COUPLANT

The couplant shall be obtained by using a medium suitable for the purpose. It shall be suitable for the temperature used. The couplant, including additives, shall not be detrimental to the material being examined. Couplants used on nickel base alloys shall not contain more than 250 ppm of sulfur. Couplants used on austenitic stainless steel shall not contain more than 50 ppm of halides (chlorides plus fluorides). A method should be employed to determine that constant coupling is achieved during examination. An examination of the test piece with its surface wiped dry should produce a record showing an absence of the couplant recording signal.

The same couplant shall be used during calibration and examination.

### 5.0 CALIBRATION/DEMONSTRATION BLOCK

#### 5.1 Calibration/Demonstration Block Material

##### 5.1.1 Material selection

The material from which the qualification and calibration blocks are fabricated shall be of the same product form and material specification or equivalent P-number grouping as one of the materials being examined.

##### 5.1.2 Heat treatment

The calibration and qualification blocks shall receive at least the minimum tempering treatment required by the material specification for the type and grade. If the calibration and qualification blocks contains welds other than cladding, and the component weld at the time of the examination has been heat treated, the block shall receive the same heat treatment.

##### 5.1.3 Reflectors



- a) Calibration blocks reflectors: Side drilled holes shall be used to confirm adequate sensitivity settings.
- b) Demonstration blocks reflectors: Surface and sub-surface notches

##### 5.1.4 Quality of calibration and demonstration blocks

Prior to fabrication, the block material shall be completely examined with a straight beam search unit. Areas that contain an indication exceeding the remaining back-wall reflection shall be excluded from the beam path; required to reach the various calibration reflectors.

##### 5.1.5 Cladding

When the component material is clad, the block shall be clad by the same welding procedure as the production part. It is desirable to have component materials, which have been clad before the dropouts, or prolongations are removed. When the cladding is deposited using an automatic welding process, and, if due to block size, the automatic welding process is impractical, deposition of clad may be by the manual method

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#### 5.1.6 Surface roughness of calibration and demonstration blocks

The roughness of the Demonstration and calibration surfaces of the blocks shall be representative for the scanning surface of the components to be examined.

### 5.2 Calibration Blocks

#### 5.2.1 Standard block

IIW VI calibration block or V2 or equivalent calibration block are a recognized test reference for sweep range scale, index point of shear wave transducer, and refracting angle.

#### 5.2.2 Calibration reference block

Reference block shall be made with notch and side-drilled hole as per ASME Section V article 4, Fig.T-434.2.1 and Fig.T-434.3 and shall be used for gain calibration and construction of reference curves. The reference calibration block shall be a section of pipe of the same nominal and schedule and normally be manufactured from the actual material examined and have approved dimensions.

#### 5.2.3 Non-piping Calibration block

The basic calibration block configuration and reflectors shall be as shown in ASME Section V article 4, Fig.T-434.2.1. The block size and reflector locations shall be adequate to perform calibrations for the beam angles used.

#### 5.2.4 Piping Calibration block

The basic calibration block configuration and reflectors shall be as shown in ASME Section V article 4, Fig.T-434.3. The block size and reflector locations shall be adequate to perform calibration for the beam angles used.

#### 5.2.5 Block Curvature

The block curvature shall be as per ASME Section V article 4.

### 5.3 Demonstration Block

#### 5.3.1 Preparation

A demonstration block shall be prepared by welding or, provided the acoustic properties are similar, the hot isotactic process (HIP) may be used.

#### 5.3.2 Thickness

The demonstration block shall be within 25% of the thickness to be examined. For welds joining two different thickness of material, demonstration block thickness shall be based on the thinner of the two materials.

#### 5.3.3 Weld joint configuration



The demonstration blocks weld joint geometry shall be representative of the production joints details.

#### 5.3.4 Flaw location

Unless specified otherwise by the referencing Code Section, the demonstration block which three EDM notches oriented and major groove faces. The flaws shall be located at or adjacent to the blocks groove faces as follows:

- (a) One surface flaw on the side of the block representing the component O.D. surface
- (b) One surface flaw on the side of the block representing the component I.D. surface
- (c) One subsurface flaw

When the scan plan to be utilized subdivides a weld into multiple examination zones, a minimum of one flaw per zone is required

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### 5.3.5 Flaw Size

Demonstration block flaw sizes shall be based on the demonstration block thickness and shall be no larger than that specified by the referencing Code Section.

- (a) Maximum acceptable flaw height for material less than 1 in. (25 mm) thickness, or
- (b) 0.25 aspect ratio acceptable flaw for material equal to or greater than 1 in. (25 mm) thickness based on the demonstration block

### 5.3.6 Single I.D. / O.D. flaw alternative

When the demonstration block can be scanned from both major surfaces during the qualification scan [e.g., joint I.D. and O.O. have a similar detail, diameter of curvature is greater than 20 in. (500 mm), no cladding or veld overlay present, etc.), then only one surface flaw is required.

### 5.3.7 One-sided exams

When, due to obstructions, the veld examination can only be performed from one side of the veld axis, the demonstration block shall contain two sets of flaws, one set on each side of the veld axis. When the demonstration block can be scanned from both sides of the veld axis during the qualification scan (e.g., similar joint detail and no obstructions), then only one set of flaws is required.

## 6.0 CALIBRATION

### 6.1 General Calibration Requirements

#### 1) Ultrasonic system: Calibration

Calibration shall be performed for complete ultrasonic system and shall be done prior to examination in the desired thickness range.

- 2) The surface condition of the calibration block shall be similar to that on which production test will be performed with respect to the surface geometry and cladding.
- 3) Same couplant shall be used for calibration as well as production testing.
- 4) Contact vedges, if used, shall be same for the calibration as well as for the production testing.
- 5) Any control, which affects instrument linearity (e. g. Filters, reject, or clipping), shall be in the same position for calibration, calibration checks, instrument linearity checks and examination.
- 6) Focal-Law: The focal law to be used during the examination shall be used for calibration.

#### 7) Beam Calibration



All individual beams used in the examination shall be calibrated to provide measurement of distance and amplitude correction over the sound path employed in the examination. This shall include applicable compensation for vedge sound path variations and vedge attenuation effects.

- 8) The maximum temperature difference between test blocks and examination surface shall not exceed 14°C.

### 6.2 PA Instrument Linearity

The following requirements shall be met at intervals not to exceed one year or prior to first use thereafter.

- 1) Screen height linearity: The PAUT equipment's screen height linearity shall be evaluated in accordance with Mandatory Appendix I of ASME Sect. V, Art.4.
- 2) Amplitude control linearity: The PAUT equipment's amplitude control linearity shall be evaluated in accordance with Mandatory Appendix II of ASME Sect. V, Art.4 for each pulse-receiver circuit
- 3) Equipment linearity shall be such that accuracy of indicated amplitude or time is  $\pm 5\%$  of actual full scale amplitude or time.

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### 6.3 Phased array system calibration

Calibration shall be performed from the surface of the calibration block which corresponds to the component surface to be examined. System calibration shall include the complete ultrasonic system. Screen distance calibration shall be at least 1-1/2 "veepaths"(also known as skip) for the minimum angle that will be used during the examination.

The system shall be calibrated for velocity and wedge delay calibration, sensitivity calibration, Time Corrected Gain (TCG) calibration. Encoder calibration and confirmation of sensitivity.

The system shall require re-calibration due any of the following conditions:

- 1) Search unit transducer or wedge change.
- 2) Search unit cable or length change.
- 3) Ultrasonic instrument change.
- 4) Change in examination personnel.
- 5) Change in type of power source.

## 7.0 PROCEDURE

### 7.1 Safety

At first, safety supervisor or technician should be confirmed regarding safety matters before starting examination. Those are included mainly of scaffolding, ladder, lighting, electric conditions and personnel safety equipments have been checked by themselves as followed Project Safety Regulation. If there is not clear for safety questions for personnel, equipment and examination, the technician has right to stop his job whenever.

### 7.2 A detailed Automated Ultrasonic examination procedure shall be prepared and qualified for each wall thickness and joint geometry to be examined prior to the start of any NOT work. Repair procedure shall be separately qualified for each joint geometry. The procedure as a minimum shall include the following:

Scope; equipment; probe type and details; surface preparation, cleaning and couplant; technique sheet for each technique specified (number of techniques to be sufficient to cover all type of joints to be covered by the procedures scope); material; weld material (if different); sketch showing joint configuration, beam coverage; extent of scan; scanning pattern; material thickness and curvature; calibrations and frequency; means of setting and scanning sensitivity levels and DAC curves; flaw location and size evaluation; acceptance criteria; reporting format; operator qualifications.

### 7.3 Lamination Check



A-UT shall be performed using a device employing automatic computer based data acquisition. The straight beam material examination (T-472 of Section V, Article 4) for reflectors that could interfere with the angle beam examination shall be performed:

- a) Manually,
- b) As part of a previous manufacturing process, or
- c) During the A-UT examination provided detection of these reflectors is demonstrated.
- d) The coverage shall be included minimum 100mm from centerline of welding.

### 7.4 Examination Coverage

The required volume of the weld and base material to be examined shall be scanned using a linear scanning technique with an encoder. Each linear scan shall be parallel to the weld axis at a constant standoff distance with the beam oriented perpendicular to the weld axis.

The ultrasonic examination area shall include the volume of the weld, plus the lesser of 25mm (1 in.) or "t" on each side of the weld.

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A documented examination strategy or scan plan shall be provided, showing transducer placement, movement, and component coverage, that provides a standardized and repeatable methodology for weld acceptance. The scan plan shall also include ultrasonic beam angle used, beam directions with respect to weld centerline, and pipe volume examined for each weld. The documentation shall be made available to the owner's Inspector.

#### 7.5 Examination side

Basically shall be examined on the both sides of welding line axis but can be examined from one side in case of another side is not available access under full coverage volume condition.

#### 7.6 Surface condition

The contact surface shall be cleaned of weld spatter, dirt, pitting, rust and/or any other impurities or roughness that will interfere with the free movement of the ultrasonic transducers or would prevent adequate transmission of ultrasound. Prior to inspection the NDT technician shall judge the suitability of the surface and when required remedial action shall be taken.

#### 7.7 Scanning

- 1) The search unit shall be maintained at a fixed distance from the weld axis by a fixed guide or mechanical means.
- 2) The examination angle(s) for E-scan and range of angles for S-scan shall be appropriate for the joint to be examined.
- 3) Scanning speed shall be such that data drop-out is less than 2 data lines per inch (25mm) of the linear scan length and that there are no adjacent data line skips.
- 4) For E-scan techniques, overlap between adjacent active apertures (i.e., aperture incremental change) shall be a minimum of 50% of the effective aperture height.
- 5) For S-scan techniques, the angular sweep incremental change shall be a maximum of 1 deg or sufficient to assure 50% beam overlap.
- 6) When multiple linear scan are required to cover the required volume of weld and base material, overlap between adjacent linear scans shall be a minimum of 10% of the effective aperture height for E-scan or beam width for S-scan
- 7) Each scan shall have an overlap of minimum 1 in. (25 mm) - (in case of re-acquisition of missing or poor data line etc.)
- 8) TOFD channel  
The TOFD gate start will be set 1 μSec before the arrival of the lateral wave and should extend up to the first back wall echo to achieve full cover of wall thickness.



#### 7.8 Data Recording

A-scan data shall be recorded in an unprocessed form with on threshold, at a minimum digitization rate of five times the examination frequency, and recording increments of a maximum of

- a) 0.04 in. (1 mm) for material < 3 in. (75 mm) thick
- b) 0.08 in. (2 mm) for material ≥ 3 in. (75 mm) thick

#### 7.9 Reflectors Transverse to the Weld Seam

As an alternate to line scanning, a manual angle beam examination may be performed for reflectors transverse to the weld axis. Manual angle beam UT shall be accordance with manual ultrasonic examination procedure based on (T-472 of Article 4, ASME Sec V).

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#### 7.10 Re-examination

- 1) Re-examination for repaired welds shall follow the same condition (same examination method, same acceptance criteria) as for the original weld.
- 2) The additional testing shall be extent a length at least equal to 1 in.(25 mm) from the both end of repaired area.
- 3) Additional NOT methods of UT and MT shall be carried out to make ensure for the repaired area

#### 8.0 TRAINING AND QUALIFICATION

All Inspectors of the PMC/OWNER (PMC/OWNER) shall be imparted training at the CONTRACTOR 's cost. The inspector shall be provided complete awareness and knowledge regarding the equipment, limitations, capabilities complete range, method of operation, calibration, scanning, including development of suitable procedure, training on variables effecting the system performance and interpretation of results.

The Ultrasonic lead operator performing the examination shall be qualified in accordance with the PMC/OWNER's written practice, ASNT-TC-1A, ASME B31 Case 181-1. The minimum qualification of AUT operator who analyze and interpret the collected data shall be a ASNT Level II or III.

Only qualified UT personnel trained in the use of the equipment and who have demonstrated the ability to properly acquire examination data, shall conduct production scan.

Scanner technician, Band setter, scribe line technician shall have sufficient experience and capabilities to perform their duties to the satisfaction of AUT operator.

#### 9.0 EVALUATION AND ACCEPTANCE CRITERIA

##### 9.1 Evaluation

##### 9.1.1 Data analysis criteria

Reflectors exceeding the limits in either a) or b) below, as applicable, shall be investigated to determine whether the indications originates from a flaw or is a geometric indication in accordance with Para. 9.1.3 (Flaw sizing) below.

- a) For amplitude-based techniques, the location, amplitude, and extent of all reflectors that produce response greater than 20% of the reference level shall be investigated.
- b) For non amplitude-based techniques, the location and extent of all images that have an indicated length greater than the limits, as applicable, shall be investigated.



##### 9.1.2 Geometric

Ultrasonic indications of geometric and metallurgical origin shall be classified as follows:

D) Indications that are determined to originate from the surface configurations(such as weld reinforcement or root geometry) or variations in metallurgical structure of materials (such as cladding to base metal interface) may be classified as geometric indications, and

- a) Need not be characterized or sized.
- b) Need not be compared
- c) Location shall be recorded

2) The following steps shall be taken to classify an indication as geometric:

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- a) Interpret the area containing the indication;
- b) Plot and verify the indication coordinate, provide a cross-sectional display showing the indication position and surface discontinuity such as root or counter bore; and
- c) Review fabrication or weld preparation drawings.

3) Alternatively other NDE methods or techniques may be applied to classify an indication as geometric (e.g. alternative UT beam angles, radiography, ID and/or OD profiling).

#### 9.1.3 Flaw sizing

The dimensions of the flaw shall be determined by the rectangle that fully contains the area of the flaw.

Flaw Sizing - Reflectors determined to be flaws shall be sized in accordance with a procedure demonstrated to size similar flaws at similar material depths. A flaw may be sized by manually analysis the data using sizing techniques that have been demonstrated on the calibration block. The dimension of the flaw shall be determined by the size of the rectangle that fully contains the area of the flaw.



#### 9.1.4 Flaw evaluation

Flaws shall be evaluated for acceptance using the applicable criteria of ASME B31 Case 181-2.

#### 9.2 Acceptance criteria

Weld quality shall be judged on the basis of the acceptability criteria mentioned in ASME B31 Case 181-2.



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<b>B-2</b>	<b>ENGINEERING DESIGN BASIS</b>
<b>B-2.11</b>	<b>SURFACE PREPARATION AND PROTECTIVE COATING</b>

**MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE,  
MANGALORE**

**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**



0	22-04-2022	Issued for Tender	AH	SDK	ASN
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Rev No.	Date	Purpose	Prepared by	Checked by	Approved by
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### Abbreviations:

AS	Alloy Steel
CS	Carbon Steel
DFT	Dry Film Thickness
DM	De-mineralized
GI	Galvanized Iron
ID	Internal Diameter
IRN	Inspection Release Note
LTCS	Low Temperature Carbon Steel
MS	Mild Steel
NB	Nominal Bore
OD	Outside Diameter
RCC	Reinforced Cement Concrete
SS	Stainless Steel
TSAC	Thermally Sprayed Aluminium Coating
WFT	Wet Film Thickness

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## 1.0 GENERAL

**1.1** This technical specifications shall be applicable for the work covered by the contract, and without prejudice to the provisions of various international codes of practice, standard specifications etc. It is understood that contractor shall carry out the work in all respects with the best quality of materials and workmanship and in accordance with the best engineering practice and instructions of Engineer-In-Charge.

**1.2** Wherever it is stated in the specification that a specific material is to be supplied or a specific work is to be done, it shall be deemed that the same shall be supplied or carried out by the contractor.

Any deviation from this standard without written deviation permit from appropriate authority will result in rejection of job.

**1.3** This specification covers the requirement for protective coating for new construction.

## 2.0 SCOPE



**2.1** Scope of work covered in the specification shall include, without being limited to the following.

**2.1.1** This specification defines the requirements for surface preparation, selection and application of primers and paints on external surfaces of equipment, vessels, machinery, piping, ducts, steel structures, external & internal protection of storage tanks for all services and chimneys if any. The items listed in the heading of tables of paint systems is indicative only, however, the contractor is fully responsible for carrying out all the necessary painting, coating and lining on external and internal surfaces as per the tender requirement.

### 2.2 Extent of Work

**2.2.1** The following surfaces and materials shall require shop, pre-erection and field painting:

- All uninsulated Carbon Steel & Alloy Steel equipments like vessels, Columns, Storage Tanks, Exchangers if any, parts of boilers etc.
- All uninsulated carbon steel and low alloy plant and related piping, fittings and valves (including painting of identification marks), furnace ducts and stacks.
- All insulated parts of vessels, boilers, chimneys, stacks, piping and steam piping and if any other insulated items present.
- All items contained in a package unit as necessary.
- All structural steel work, pipe, structural steel supports, walkways, handrails, ladders, platforms etc.

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- Flare lines, external surfaces of MS chimney with or without refractory lining and internal surfaces of MS chimney without refractory lining. (If present)
- Identification of color bands on all piping as required including insulated aluminum clad, galvanized, SS and nonferrous piping.
- Identification lettering/ numbering on all painted surfaces of equipment/piping insulated aluminum clad, galvanized, SS and non-ferrous piping.
- Marking Me identification signs on painted surfaces of equipment/piping including hazardous service.
- Supply of all primers, paints and all other materials required for painting (other than Owner supplied materials)
- Over insulation surface of equipments and pipes wherever required.
- Painting under insulation for carbon steel, alloy steel and stainless steel as specified.
- Painting of pre-erection/fabrication and Shop primer.
- Repair work of damaged pre-erection/ fabrication and shop primer and weld joints in the field/site before and after erection as required.
- All CS Piping, equipments, storage tanks and internal surfaces of RCC tanks in ETP plant.
- Quality control, testing and inspection during all stages of work (surface preparation, application of coating and testing of furnished coating) **along with the Involvement of Paint Manufacturer.**



2.2.2 The following surfaces and materials shall not require painting in general. However, if there is any specific requirement by the owner, the same shall be painted as per the relevant specifications:

- a. Uninsulated austenitic stainless steel.
- b. Plastic and/or plastic coated materials
- c. Non-ferrous materials like aluminum, Cu-Ni alloy, galvanized steel.

## 2.3 Documents

2.3.1 The contractor shall perform the work in accordance with the following documents issued to him for execution of work.

- a. Bill of quantities for piping, equipment, machinery and structures etc

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b. Piping Line List.

- 2.4** Unless otherwise instructed, final paint coating (i.e., application of field primer, wherever required, intermediate and top coats) on pre-erection/ shop primed equipments shall be applied at site, only after all welding, testing on systems are completed as well as after completion of steam purging wherever required.
- 2.5** Changes and deviations required for any specific job due to clients requirement or otherwise shall be referred to MRPL for deviation permit.

**3.0 REFERENCE CODES & STANDARDS**



- 3.1** Without prejudice to the provision of Clause 1.1 above and the detailed specifications of the contract, latest editions of the following codes and standards are applicable for the work covered by this contract.

IS-5	Color coding
RALDUTCH	International Standard for color shade (Dutch Standard)
IS-101	Methods of test for ready mixed paints and enamels
IS-2379	Indian Standard for Pipe line identification-color code
ISO-12944	Corrosion Protection of steel Structures by Protective Paint System
ASTM-Vol6.01&6.03	American standard test methods for Paints and Coatings.
ANSI A 13.1	Scheme for identification of piping systems: American National Standards Institution
SSPC	Steel Structures Painting Council

**3.2 Surface Preparation Standards**

The latest editions of any of the following standards shall be followed for surface preparation:

- 3.2.1** ISO 8501-1/SIS-0559 00: ISO standard for Preparation of steel substrates before application of paints and related products. This standard contains photographs of the various standards on four different degrees of rusted steel and as such is preferable for inspection purpose by the Engineer-In-Charge.
- 3.2.2** Steel Structures Painting Council, U.S.A. (Surface Preparation Specifications (SSPC-SP)).
- 3.2.3** National Association of Corrosion Engineers, U.S.A., (NACE).
- 3.2.4** Various International Standards equivalent to Swedish Standard for surface preparations are given in Table-I.
- 3.3** The contractor shall arrange, at his own cost, to keep a set of latest edition of above standards and codes at site.

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- 3.4** The paint manufacturer's instructions shall be followed as far as practicable at all times for best results. Particular attention shall be paid to the following:
- a. Instructions for storage to avoid exposure as well as extremes of temperature.
  - b. Surface preparation prior to painting shall be followed as per Table 8.0 to 16.0 of this standard shall be followed.
  - c. Mixing and thinning.
  - d. Application of paints and recommended limit on time intervals in between coats.

#### **4.0 EQUIPMENT**



- 4.1** All tools, brushes, rollers, spray guns, blast material, hand power tools for cleaning and all equipments, scaffolding materials, shot & grit blasting equipments & air compressors etc. required to be used shall be suitable for the work and all in good order and shall be arranged by the contractor at site and in sufficient quantity. The manufacturer's test certificates I data sheets for all the above items shall be reviewed by Engineer-in-charge at site before start of work.
- 4.2** Mechanical mixer shall be used for paint mixing operations in case of two pack systems except that the Engineer-In-Charge may allow the hand mixing of small quantities at his discretion in case of specific requirement for touch up work only.

#### **5.0 SURFACE PREPARATION, SHOP PRIMER COATING APPLICATION & REPAIR AND DOCUMENTATION**

##### **5.1 General**

- 5.1.1 In order to achieve the maximum durability, one or more of following methods of surface preparation shall be followed, depending on condition of surface to be painted and as instructed by Engineer-In-Charge. Adhesion of the paint film to surface depends largely on the degree of cleanliness of the metal surface. Proper surface preparation contributes more to the success of the paint protective system.
- a. Abrasive blast cleaning
  - b. Mechanical or power tool cleaning
- 5.1.2 Mill scale, rust, rust scale and foreign matter shall be removed fully to ensure that a clean and dry surface is obtained. Unless otherwise specified, surface preparation shall be done as per provisions of relevant tables given elsewhere in this specification. The minimum



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acceptable standard, in case of thermally sprayed metal coatings, in case of mechanical or power tool cleaning it shall be St. 3 or equivalent. In case of blast cleaning it shall be Sa 2-1/2 as per Swedish Standard SIS-055900 (latest edition) or SSPC-SP or ISO 8501-01. Blast cleaning shall be Sa 3 as per Swedish Standard in case thermally sprayed metal coatings.

Before surface preparation by blast cleaning, the surface shall be degreased by aromatic solvent to remove all grease, oil etc.



- 5.1.3 Irrespective of whether external or internal surface to be coated, blast cleaning shall not be performed where dust can contaminate surfaces undergoing such cleaning or during humid weather conditions having humidity exceed 85%. In case of internal coating of storage tanks, dehumidifier shall be used, to control humidity level below 60%. Dehumidifier should depress the dew point of air in the enclosed space, sufficient enough so as to maintain it 3°C below the metal substrate temperature during centre period of blasting and coating application. During the interval time between application of primer coat and subsequent intermediate and top coats or between blast cleaning completion and start of application of primer coat, dehumidifier unit should be in continuous operation to ensure that no condensation occurs on substrate.

Dehumidifier should be able to maintain grain drop (moisture removal) at the rate of 25 grains per pound of air per hour. Dehumidifier should have capacity of at least 2 air changes per hour of the enclosed space. All necessary psychometric data should be collected by contractor for the given site conditions before starting operation of dehumidifier to ensure that desired values of dew point, moisture content in enclosed scope is achieved.

Dehumidification to be maintained round the clock for surface preparation and painting till the total coating application is over.

Dehumidifier shall not be stopped under any condition till the entire blasted surface is primed to the satisfaction of the technical representative of the paint manufacturer interested with quality assurance for the work. In case the dehumidifier breaks down in middle of the job, the same shall be replaced at the risk and the cost of the contractor and the entire unfinished work shall be repeated.

- 5.1.4 The Engineer in-charge shall have the right to disallow usage of dehumidifier if the performance is not meeting the specified requirements. Under such circumstances the contractor shall remove the equipment and replace the same with another equipment to provide satisfactory results without any additional cost to the owner.
- 5.1.5 Irrespective of the method of surface preparation, the first coat of primer must be applied by airless spray/ air assisted conventional spray if recommended by the paint manufacturer on dry surface. This should be done immediately and in any case within 4

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hours of cleaning of surface. However, at times of unfavorable weather conditions, the Engineer-In-Charge shall have the liberty to control the time period, at his sole discretion and/or to insist on re-cleaning, as may be required, before primer application is taken up. In general, during unfavorable weather conditions, blasting and painting shall be avoided as far as practicable.

- 5.1.6 The external surface of R.C.C. Chimney to be painted shall be dry and clean. Any loose particle of sand, cement, aggregate etc. shall be removed by scrubbing with soft wire brush. Acid etching with 10-15% HCL solution for about 15 minutes shall be carried and surface must be thoroughly washed with water to remove acid & loose particles and then dried completely before application of paint.

## 5.2 Procedure for Surface Preparation



### 5.2.1 Air Blast cleaning with abrasives

The surfaces shall be blast cleaned using one of the abrasives like angular chilled cast iron or steel grit, copper slag or Nickel slag, A1203 particles at pressure of 7kg/cm<sup>2</sup> at an appropriate distance and angle depending of nozzle size maintaining constant velocity and pressure. Chilled cast iron or steel shall be in the form of shot or grit of size in the range of G 16 - G42 conforming to SSPC AB 1 and 8250 grade size of steel shots (maximum) to obtain a desired surface profile of 35-50 microns trough to peak. For all other abrasives, size shall be in the range of G 16 - G24. The combination of steel grits and shots shall be normally in the ratio of 3: 1. The quality of abrasives shall be free from contaminants and impurities and shall meet the requirements of SSPC AB 1. Compressed air shall be free from moisture and oil. The blasting nozzles should be venture style with tungsten carbide or boron carbide as the materials for liners. Nozzles orifice may vary from 3/16" to: Y..." On completion of blasting operation, the blasted surface shall be clean and free from any scale or rust and must show a grey white metallic luster. Primer/first coat of paint shall be applied within 4 hours of surface preparation. Blast cleaning shall not be done outdoors in bad weather without adequate protection or when there is dew on the metal, which is to be cleaned. Surface profile shall be uniform to provide good key to the paint adhesion (i.e. 35 to 50 microns). If possible vacuum collector shall be installed for collecting the abrasives and recycling.

### 5.2.2 Mechanical or Power Tool Cleaning

Power tool cleaning shall be done by mechanical striking tools, chipping hammers, grinding wheels or rotating steel wire- brushes. Excessive burnish of surface shall be avoided as it can reduce paint adhesion. On completion of cleaning, the detached rust mill scale etc. shall be removed by clean rags and /or washed by water or steam and thoroughly dried with compressed air jet before application of paint.

## 5.3 Non-Compatible Shop Coat Primer

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For equipments on which application of total protective coating (Primer + Intermediate + top coat) is carried out at shop, compatibility of finish coat with primer should be checked with paint manufacturer. If the shop coat is in satisfactory condition showing no major defect upon arrival at site, the shop coat shall not be removed.

- 5.4** Shop coated equipments (coated with Primer & finishing coat) should not be repainted unless paint is damaged. Repair shall be carried out as per Table 7 .2 of paint systems depending upon compatibility of paint.
- 5.5** Shop primed equipment and surfaces will only be 'spot cleaned' in damaged areas by means of power tool brush cleaning or hand tool cleaning and then spot primed before applying one coat of field primer unless otherwise specified. If shop primer is not compatible with field primer then shop coated primer should be completely removed before application of selected paint system for particular environment.
- 5.6** For Package units/equipment, shop primer should be as per the paint system given in this specification. However, manufacturer's standard can be followed after review.

As mentioned in section 2.4, all coating application at field (field primer, intermediate and top coat) on equipments, structures, piping, etc, shall be carried out only after its erection and all welding, testing, steam purging (wherever carried out) have been completed.



### **5.7 Coating Procedure and Application**

All paint coatings shall be applied by airless spray excepting at the following special cases where application can be carried out by brush subject to suitability of the application of the paint product by brush.

- Spot repair
- Stripe coating on edges
- Small bore parts not suitable for spray application.

Irregular surfaces such as sharp edges, welds, small brackets, and interstices may stripe coated to ensure specified DFT is achieved. Paint manufacturer recommendation should be followed before deciding for brush application.

- 5.7.1** Surface shall not be coated in rain, wind or in environment where injurious airborne elements exists, when the steel surface temperature is less than 5°F above dew point when the relative humidity is greater than 85% or when the temperature is below 40°F and when the ambient/substrate temp is below the paint manufacturer's recommended temperature of application and curing. De-humidifier equipment shall be used to control RH and Dew point. The paint application shall not be done when the wind speed exceeds 20km per hour.
- 5.7.2** Blast cleaned surface shall be coated with one complete application of primer as soon as practicable but in no case later than 4 hrs the same day.

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5.7.3 To the maximum extent practicable, each coat of material shall be applied as a continuous film uniform thickness free of probes. Any spots or areas missed in application shall be recoated and permitted to dry before the next coat is applied. Applied paint should have the desired wet film thickness.

5.7.4 Each coat shall be in proper state of cure or dryness before the application of succeeding coat. Material shall be considered dry for recoating when an additional coat can be applied without the development of any detrimental film irregularities, such as lifting or loss of adhesion of the under coat. Manufacturer instruction shall be followed for inter coat interval.

5.7.5 When the successive coat of the same color have been specified, alternate coat shall be tinted, when practical, sufficiently to produce enough contrast to indicate complete coverage of the surface. The tinting material shall be compatible with the material and not detrimental to its service life and shall be recommended by the original paint manufacturer.



5.7.6 Airless spray application shall be in accordance with the following procedure: as per steel structure paint Manual Vol.1 & Vol.2 by SSPC, USA, Air less spray relies on hydraulic pressure rather than air atomization to produce the desired spray. An air compressor or electric motor issued to operate a pump to produce pressures of 1000 to 6000 psi. Paint is delivered to the spray gun at this pressure through a single hose within the gun; a single paint stream is divided into separate streams, which are forced through a small orifice resulting in atomization of paint without the use of air. This results in more rapid coverage with less over spray. Airless spray usually is faster, cleaner, more economical and easier to use than conventional air spray.

Airless spray equipment is mounted on wheels, and paint is aspirated in a hose that sucks paint from any container, including drums. The unit shall have in built agitator that keep the paint uniformly mixed during the spraying. The unit shall consist of in built strainer. Usually very small quantity of thinning is required before spray. In case of high build epoxy coating (two packs). 30:1 pump ratio and 0.020-0.023" tip size will provide a good spray pattern. Ideally fluid hoses should not be less than 3/8" ID and not longer than 50 ft to obtain optimum results.

In case of gun choking, de-choking steps shall be followed immediately.

5.7.7 Brush application of paint shall be in accordance with the following:

- a. Brushes shall be of a style and quality that will enable proper application of paint.
- b. Round or oval brushes are most suitable for rivets, bolts, irregular surface, and rough or pitted steel. Wide flat brushes are suitable for large flat areas, but they shall not have width over five inches.

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- c. Paint shall be applied into all comers.
- d. Any runs or sags shall be brushed out.
- e. There shall be a minimum of brush marks left in the applied paint.

f. Surfaces not accessible to brushes shall be painted by spray, daubers, or sheepskin.

5.7.8 For each coat the painter should know the WFT corresponding to the specified OFT and standardize the paint application technique to achieve the desired WFT. This has to be ensured in the qualification trial.

## 5.8 Drying of Coated Surfaces

5.8.1 No coat shall be applied until the preceding coat has dried. The material shall be considered dry for re-coating when another coat can be applied without the development of any film irregularities such as lifting or loss of adhesion of undercoats. Drying time of the applied coat should not exceed maximum specified for it as a first coat; if it exceeds the paint material has possibly deteriorated or maxing is faulty.

5.8.2 No paint shall be force dried under conditions which will cause chalking, wrinkling, blistering formation of pores, or detrimentally affect the conditions of the paint.

5.8.3 No drier shall be added to paint on the job unless specifically called for in the manufacturer's specification for the paint.



5.8.4 Paint shall be protected from rain, condensation, contamination, snow and freezing until dry to the fullest extent practicable.

## 5.9 Spot Repair of Damaged Primer

5.9.1 Where pre erection shop primer has been damaged at isolated localized spots during handling and transportation, or after erection I welding, the repair of damaged coating of pre-erection I pre-fabrication or shop primer shall be done as given below and as per the Table 7.2 of this specification.

5.9.2 Repair of damaged inorganic zinc silicate pre-erection I pre-fabrication or shop primer (F9) after erection I welding in the design temperature of -90°C to 400°C and damaged silicone aluminum (F-12) pre-erection I pre-fabrication or shop primer after erection I welding for design temperature range of 401 - 550 °C.

Surface Preparation: Quickly remove the primer from damaged area by mechanical scraping and emery paper conforming to SSPC-SP-3 to expose the white metal. Blasts clean the surface, if possible. Feather the primed surface over the intact adjacent surface surrounding the damaged area by emery paper.

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Primer coating: One coat of F-9 shall be applied wherever damage was observed on pre-erection I pre-fabrication or shop primer of inorganic zinc silicate coating (F-9). Similarly one coat of F-12 shall be applied wherever damage observed on pre-erection I pre-fabrication shop primer of silicone aluminum (F-12).

5.9.3 Wherever if damaged areas are found extensive and spread over large areas, then entire pre-erection I pre-fabrication or shop primer shall be removed by blasting to achieve SSPC-SP-10 then entire blasted surface shall be primed again with F-9 or F-12 as applicable for the intended design temp. (See note under table 7.2).

## 5.10 Paint Application

5.10.1 Shop priming/pre-erection priming with F9 or F 12 shall be done only on blasted Surface (SSPC-SP-10)

5.10.2 Shop priming I pre-erection priming with F9 or F12 shall be done only with airless spray.

5.10.3 Assessment of Painting Requirement

The paint system to be applied for a specific job shall be arrived at sequentially as given below:



- Identify the environment from area classification details and chose the appropriate table.
- Identify the design temperature from the technical documents
- Identify the specific field paint system and surface preparation requirement from the above identified table and temperature range.
- Identify the shop priming requirement from Table 7.1 based on compatibility of the above paint system.
- Identify the need of repair of shop primer and execute as per Table 7 .2.

## 5.11 Documentation and Records

5.11.1 A written quality plan with procedure for qualification trials and for the Actual work including test and inspection plan & procedure for approval before start of work.

5.11.2 Daily progress report with details of weather conditions, particular of Applications, no of coats and type of materials applied, anomalies, progress of Work versus program.



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5.11.3 Results of measurement of temperatures relative humidity, surface profile, film thickness, holiday detection, adhesion tests with signature of appropriate authority.

5.11.4 Particulars of surface preparation and paint application during trials and during the work.

5.11.5 Details of non-compliance, rejects and repairs.

5.11.6 Type of testing equipments and calibration.

5.11.7 Code and batch numbers of paint materials used.



The coating applicator must maintain a job record consisting of all the information as per 5.11.2 – 5.11.7 above as well as the approved procedure of work (5.11.1 above). The job record consisting of information as required in accordance to 5.11.2 - 5.11.7 shall be entered on daily basis and should be daily signed by Engineer-in-charge.

After completion of the job, along with the final documentation, contractor shall submit the document for the total quantum of job carried out, quantity of paint used area wise / equipment wise. Test certificates, stage wise inspection reports, manufacturer's guarantee certificate, stage wise inspection / witness certificate from paint manufacturer.

**TABLE-1 (FOR CLAUSE 5.0)  
SURFACE PREPARATION STANDARDS**

SI. No.	DESCRIPTION	VARIOUS INTERNATIONAL STANDARDS (EQUIVALENT)			REMARKS
		ISO 8501-1/ SIS-OS 59 00	SSPC-SP, USA	NACE, USA	
1.	Manual or hand tool cleaning Removal of loose rust, loose mill scale and loose paint, chipping, scrapping, sanding and wire brushing. Surface should have a faint metallic sheen	ST.2	SSPC-SP-2	--	This method is applied when the surface is exposed to normal atmospheric conditions when other methods cannot be adopted and also for spot cleaning during maintenance painting
2.	Mechanical or power tool cleaning Removal of loose rust loose mill scale and loose paint to degree specified by power tool chipping, descaling, sanding, wire brushing and grinding, after removal of dust, surface should have a pronounced metallic sheen.	ST.3	SSPC-SP-3	--	
3.	Dry abrasive Blast cleaning There are four common grades of blast cleaning				
3.1	White metal Blast cleaning to white metal cleanliness. Removal of all visible rust. Mill scale, paint & foreign matter	SA3	SSPC-SP-5	NACE #1	Where extremely clean surface can be expected for prolong life of paint system.





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SI. No.	DESCRIPTION	VARIOUS INTERNATIONAL STANDARDS (EQUIVALENT)			REMARKS
		ISO 8501-1/ SIS-OS 59 00	SSPC-SP, USA	NACE, USA	
	100% cleanliness with desired surface profile.				
3.2	Near white metal  Blast cleaning to near white metal cleanliness, until at least 95% of each element of surface area is free of all visible residues with desired surface profile	SA 2\12	SSPC-SP-10	NACE #2	The minimum requirement for chemically resistant paint systems such as epoxy, vinyl, polyurethane based and inorganic zinc silicate paints, also for conventional paint systems used under fairly corrosive conditions to obtain desired life of paint system.
3.3	Commercial Blast Blast cleaning until at least two-third of each element of surface area is free of all visible residues with desired surface profile.	SA2	SSPC-SP-6	N0.3	For steel required to be painted with conventional paints for exposure to mildly corrosive atmosphere for longer life of the paint systems.
3.4	Brush-off Blast Blast cleaning to white metal cleanliness, removal of all visible rust, mill scale, paint & foreign matter. Surface profile is not so important	SA 1	SSPC-SP-7	N0.4	



## 6.0 PAINT MATERIALS

Paint manufacturers shall furnish the characteristics of all paints materials on original printed literature, along with the test certificate for all specified characteristics given in this specification. All the paint materials shall be of first quality and conform to the following general characteristics as per the tables 6.1, 6.2, 6.3 and 6.4.

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**PAINT MATERIALS  
TABLE NO.6.1 PRIMERS**

Sl. No.	DESCRIPTION	P-2	P-4	P-6	P-7
1	Technical name	Chlorinated rubber Zinc Phosphate primer.	Etch primer/wash primer	Epoxy zinc phosphate primer	ZINGA, LOCKTITE or ZRC cold zalvanizine
2	Type and composition	Single pack, air drying chlorinated rubber based medium plasticised with unsaponifiable plasticizer, pigmented with zinc phosphate.	Two pack polyvinyl butyral resin medium cured with phosphoric acid solution pigmented with zinc tetroxy chromate.	Two component polyamine cured epoxy resin medium, pigmented with zinc phosphate.	One pack Synthetic Resin based zinc galvanizing containing min 92% of electrolytic zinc dust of 99.95% purity.
3	Volume Solids %	40±3	10±1	50±1	37%
4	DFT (Dry Film thickness) per coat in microns	40-45	8-10	40-50	40-50µ
5	Theoretical covering capacity in M <sup>2</sup> /coat/ litre	8-10	8-10	8-10	4m <sup>2</sup> /kg
6	Weight per litre in kgs/litre	1.3±0.05	1.2±0.05	1.4±0.05	2.67 kg at 15°C
7	Touch dry at 30°C (minimum)	30 minutes	2 hrs.	After 30 min.	10 minutes
8	Hard dry at 30°C (maximum.)	8 hrs.	24 hrs.	8 hrs	24 hrs.
9	Overcoating interval	Min.: 8 hrs	Min: 4-6 hrs.	Min.:8hrs.	Min.:4 hrs
10	Pot life at 30°C for two component paints	Not Annlicable	Not applicable	6 - 8 hrs.	Unlimited
11	Temperature (Resistance (minimum)	60°C Drv service	NA Drv service	80°C Drv service	50°C Drv service

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**PAINT MATERIALS  
TABLE No. 6.2 FINISH PAINTS**

Sl. No.	DESCRIPTION	F-2	F-3	F-6A/B	F-6C	F-7
1	Technical Name	Acrylic Polyurethane Finish paint	Chlorinated rubber based finish paint	Epoxy -High Build coating	Solvent less epoxy coating	High build coal tar epoxy coating
2	Type composition and	Two-pack aliphatic isocyanate cured acrylic finish paint	Single pack plasticized chlorinated rubber based medium with chemical and weather resistant pigments.	F-6A Two-pack Aromatic amine cured epoxy resin suitably pigmented. F-6B : polyamide cured epoxy resin medium suitably pigmented	Two pack, cured with Amine Adduct; catalyzed epoxy resin suitably pigmented	Two pack polyamide cured epoxy resin blended with coaltar medium, suitably pigmented
3	Volume Solids%	40±3	38±2	60±3	99±1	65±3
4	DFT (Dry Film thickness) per coat in microns	30-40µ	30-40	100-125µ	200-500	100-125µ
5	Theoretical covering capacity in M2/coat/litre	11-15	11-15	5-6	2-3	5.2-6.5
6	Weight per liter in kags/litre	1.15±0.03	1.15±0.03	1.42±0.03	1.40±0.03	1.40±0.03
7	Touch dry at 30°C	30 minutes	30 minutes.	3 hrs.	3 hrs.	4 hrs.
8	Hard dry at 30°C Full cure at 30°C (for immersion/high	8 hrs	8 hrs	16 Hrs 5 days	16 hrs	48 hrs 5 days
9	Over-coating interval at 30°C	30 minutes	30 minutes	3 hrs.	3 hrs.	4 hrs.
10	Pot life (approx.) at 30°C for two component paints	6-8 hrs.	Not applicable	4-6 hrs	30 minutes	4-6 hrs.
11	Temperature Resistance (minimum)	80°C Dry service min	60°C Immersion service	80°C Dry service	120°C (Dry service), 50°C (Immersion service)	125°C Immersion service

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**PAINT MATERIALS  
TABLE No.6.18 FINISH**

Sl. No.	DESCRIPTION	F-8	F-9	F-11	F-12
1	Technical name	Self priming type surface tolerant high build epoxy coating (complete rust control coating)	Inorganic zinc silicate coating	Heat resistant synthetic medium based two pack Aluminium paint suitable upto 250°C dry temp	Heat resistant silicone Aluminium paint suitable upto 500°C dry temp
2	Type & composition	Two pack epoxy resin based suitable pigmented and capable of adhering to manually prepared surface and old coating	A two pack air drying self curing solvent based inorganic zinc silicate coating with minimum 80% zinc content on dry film. The final cure of the dry film shall pass the MEK rub test	Heat resistant synthetic medium based two pack Aluminium paint suitable upto 250°C	Single pack silicone resin based medium with Aluminium flakes
3	Volume Solids	78+3	60+3	38+0.03	20+2
4	DFT (Dry Film thickness) per coat in microns	100-125	65-75	15-20	15-20
5	Theoretical covering capacity in M <sup>2</sup> /coat/litre	6.0-7.2	8-9	10-12	8-10
6	Weight per liter in kgs/litre	1.41+0.03	2.3+0.03	0.95+0.03	1.00+0.03
7	Touch dry at 30°C (maximum)	3 hrs.	30 minutes	3 hrs.	30 minutes
8	Hard dry at 30°C (maximum) Full cure 30°C (for immersion/high temperature service)	24 hrs 5 days	12 NA	12 NA	24 hrs NA
9	Over-coating interval	Min. : 10 hrs	Min. : 12 hrs. at 20°C & 50% RH	Min. 24 hrs	Min.:24 hrs
10	Pot life at 30°C for two component paints	90 minutes	4-6 hrs.	Not applicable	Not applicable
11	Temperature Resistance (minimum)	80°C Dry service	400°C Dry service	250°C Dry service	500°C Dry service

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**PAINT MATERIALS  
TABLE No.6.4 FINISH PAINTS**



Sl. No.	DESCRIPTION	F-14	F-15	F-16	F-17
1	Technical name	Polyamine cured coal tar epoxy	Two-component Epoxy phenolic coating cured with Polyamine adduct hardner system (primer + intermediate coat + finish paint)	Ambient temperature curing Poly Siloxane coating/High build cold applied inorganic copolymer based aluminium coating suitable for under insulation coating of CS and SS piping for high temperature service	Two component solvent free type high build epoxy phenolic/novolac epoxy phenolic coating cured with Polyamine adduct hardner system
2	Type & composition	Specially formulated polyamine cured coal tar epoxy suitable for application under insulation	Two pack ambient temperature curing epoxy phenolic coating system suitable for application under insulation of CS/SS piping	Amercoat 738 from PPG Protective & Marine Coatings or Intertherm 751 CSA of International (Akzo Nobel). Note : 6	Two component solvent free type high build epoxy phenolic/novolac epoxy phenolic coating cured with Polyamine adduct hardner system
3	Volume Solids %	70+3	70+3	60+2	98-100
4	DFT (Dry Film thickness) per coat in microns	100-125	75-100	75-100	125-150
5	Theoretical covering capacity in M <sup>2</sup> /coat/litre	5-8	4-5	7.0-9.0	6.5-8
6	Weight per liter in kgs/litre (mix paint)	1.45+0.03	1.65+0.03	1.3	1.7
7	Touch dry at 30°C (maximum)	4 hrs.	3 hrs	1 hr	2 hrs
8	Hard dry at 30°C (maximum) Full cure 30°C (for immersion/high temperature service)	24 hrs  168 hrs (7 days)	24 hrs  168 hrs (7 days)	16 hrs	24 hrs  168 hrs (7 days)

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Sl. No.	DESCRIPTION	F-14	F-15	F-16	F-17
9	Over-coating interval	Min. : 6 hrs Max. 5 days	Min. : 36 hrs. Max. 21 days	Min. 16 hrs Max. Not applicable	Min.: 16 hrs Max. : 21 days
10	Pot life at 30°C for two component paints	4 hrs	4-6 hrs.	1 hr	1 hr
11	Temperature Resistance	-45°C to 125°C under insulation and immersion	-45°C to 150°C under insulation & immersion (Note : 5)	a) upto 400°C for C. Steel & S. Steel for Intertherm 751 CSA b) upto 480°C for C. Steel & upto 600°C for S. Steel for Amercoat 738	-45°C to 150°C for immersion service

## NOTES (for tables 6.1 to 6.4):

- Covering capacity and DFT depends on method of application. Covering capacity specified above is theoretical. Allowing the losses during application, min specified OFT should be maintained.
- All primers and finish coats should be cold cured and air drying unless otherwise specified.
- All paints shall be applied in accordance with manufacturer's instructions for surface preparation, intervals, curing and application. The surface preparation, quality and workmanship should be ensured. In case of conflict between this specification and manufacturer's recommendation, the same shall be clarified through EIL SMMS department.
- Technical data sheets for all paints shall be supplied at the time of submission of quotations.
- F-15: Two-component Epoxy phenolic coating cured with Polyamine adduct hardener system (primer + intermediate coat + finish paint) suitable up to 225°C (Intertherm 228 from M/s Akzo Nobel Coatings India Pvt Ltd. Bangalore). For all other companies, the temperature resistance shall be a maximum of 150°C.
- F- 16: Ambient temperature curing epoxy poly siloxane Coating or high build cold applied inorganic co-polymer based aluminum coating.

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**Amercoat 738** from PPG Protective & Marine coatings. Mumbai, is suitable up to 480°C for CS surfaces and 600°C for SS surfaces.

**Intertherm 751** from Akzo Nobel Coatings India Pvt Ltd. Bangalore, Inorganic co-polymer cold applied Aluminum spray coating is suitable up to 400°C of CS & SS surfaces

## 7.0 COATING SYSTEMS

The coating system should be selected based on the Plant location as given below:

### Classification based on Plant Location:

**a. Plant located in Inland area (more than 50 km from coast);**

Environment Classification - Industrial

- For offsite areas: Table 9.0 to be followed
- For all unit areas including DM.CPP and Cooling Tower: Table 10.0 to be followed

**b. Plant located on sea coast or within 50 km from sea coast;**

Environment classification- Industrial marine



- For offsite area, as well as all unit area including DM, CPP, Cooling Tower: Table 10.0 to be followed

**c. For external surface of above ground tanks, table 12.0 to be followed for all locations (Inland or coastal)**

### NOTES:

1. Coating systems (Primers, Finish Paints etc.) based on Area classification/environments/Applications are tabulated in Table 8.0 to Table 17.0
2. Primers & Finish paints covered in Tables 8.0 to 17.0 are listed in Table 7.1.
3. Repair of Pre-Erection/Pre-Fabrication & Shop priming after erection/ welding shall be done as per Table 7.2.



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**TABLE 7.1 : LIST OF PRIMERS & FINISH COATS COVERED IN TABLE NOS. 8 TO 18.0**

<b>PRIMERS</b>	
P-2	Chlorinated rubber zinc Phosphate Primer
P-4	Etch Primer/Wash Primer
P-6	Two component Epoxy Zinc Phosphate Primer cured with polyamine hardner
P-7	Single pack, cold galvanizing compounds containing minimum 92% electrolytic zinc in dry film. Make ZINGA, LOCKTITE (of HENKEL) or ZRC
<b>FINISH COATS / PAINTS</b>	
F-2	Two component Acrylic – Polyurethane finish paint
F-3	Chlorinated Rubber finish paint
F-6A	High Build Epoxy finish coating cured with polyamine hardener
F-6B	High Build Epoxy finish coating cured with polyamine hardener
F-6C	Solvent less Epoxy Coating cured with poly amine hardener
F-7	High build Coal Tar epoxy coating cured with polyamine hardener
F-8	Self priming surface Tolerant High Build epoxy coating, cured with polyamine hardener
F-9	Two component Inorganic Zinc Silicate coating
F-11	Heat resistant synthetic medium based Aluminium paint
F-12	Two component Heat resistant Silicone Aluminium paint
F-14	Specially formulated coal tar epoxy coating, cured with polyamine hardener
F-15	Two component Epoxy phenolic coating cured with Polyamine adduct hardener system
F-16	Engineered Epoxy poly Siloxane Coating or high build cold applied inorganic co-polymer based aluminium coating
F-17	Two component solvent free type high build epoxy phenolic/Novalac epoxy phenolic coating cured with Polyamine adduct hardener system



**TABLE 7.2 REPAIR OF PRE-ERECTOR/PRE-FABRICATION OR SHOP PRIMER AFTER ERECTION/WELDING**

For all un-insulated CS, LTCS & low allow steel items in all Environments

Sl. No.	Design Temp. in °C	Surface Preparation	Coating System	Total DFT in Microns (min.)	Remarks
7.2.1	-90 to 400	SSPC-Sp-3	1 coat of F-9	65-75	See note below and clause 5.9.3

**NOTES:**

1. The application and repair of pre-erection/pre-fabrication or Shop Primer given in above tables shall be done for all the items to be painted. In case the damages of primer are severe and spread over large area. entire primer shall be removed by blasting to achieve SSPC-SP-10 and surfaces to be primed again with F-9 or F-12 as applicable.

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**TABLE 8.0 COATING SYSTEMS FOR GRATINGS, ROLLING & STATIONERY LADDERS, SPIRAL STAIRWAYS AND HAND RAILS IN ALL LOCATION**

Sl. No.	Design Temp. in °C	Coating System	Total DFT in Microns (min.)
8.1	Up to 60	Hot Dip Galvanizing to 80-85 microns (600-610 gm/m <sup>2</sup> ) as per IS 4759, 2629, 4736, 2633 + 1 coat of P-6 @ 40 DFT/coat + 1 coat of F-2 @ 40 microns DFT/coat	80 microns of finish coat (excluding the thickness of galvanizing)



**NOTES:**

1. No galvanized specimen shall have thickness less than 80 microns.
2. Repair of the damaged area of galvanized coatings due to welding during erection shall be carried out as per recommended practice IS 11759 using cold galvanizing spray process. Organic Paint systems are not acceptable for repair.
3. After repair of damaged galvanized coating by Cold Galvanized, the repaired area shall be top coated with paint system as given in Table 8.0 above (i.e., 1 coat of P-6 @ 40μ DFT/coat + 1 coat of F-2 @40μ OFT/coat).
4. Approved Cold Galvanizing manufacturers are ZINGA, LOCKTITE or Z.R.C.

**TABLE 9.0 COATING SYSTEMS FOR OFFSITE AREA (INLAND PLANTS)**

For external surfaces of Un-insulated & above ground (atmospheric exposure) Structures, Piping, Vessels, Equipments, Pumps, etc. (Note-1); (For Carbon Steel, LTCS & Low Alloy Steel). See Note Below\*

Sl. No.	Design Temp in °C	Surface Preparation & Pre-erection/Shop Primer	Coating System (Post-erection/Field)		Total Final DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
9.1	-90 to -15	SSPC-Sp-10; 1 coat of F-9 @ 65-75 DFT/coat	None	None	65-75	No over-coating to be done on F-9 as it will lead to mud cracking.
9.2	-14 to 60	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	1coat of F-2 @ 40 DFT/coat	105.115	
9.3	61 to 80	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	1 coat of F-2 @ 40 DFT/coat	105-115	
9.4	81 to 250	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	2 coats of F-11 @ 20 DFT/coat; (2x20=40)	105	



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9.5	251-400	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	2 coats of F-12 @ 20 DFT/coat (2x20=40)	105.115	F-12 shall be ambient temperature curing type.
9.6	401 to 550	SSPC-SP-10; 1 coat of F-12 @ 20 DFT/coat	None	2 coats of F-12 @ 20 DFT/coat (2x20=40)	60	

\* Flare line within unit or offsite areas shall be coated as per Clause 10.3 of Table 10.0, but having finish coat of 2 coats of F-12.

### **NOTES:**

1. The list of items given in the heading of the above table is not exhaustive. There may be more items for a particular contract where these specifications are used. The Contractor is fully responsible for completing painting including prefabrication primer for all the items supplied and fabricated through his scope of work as per tender document.
2. If the Pre-erection/Pre-fabrication & Shop Primer has already been completed, the same shall not be repeated again in the field. In case the damages of primer are severe and spread over large areas, the engineer-in-charge may decide & advise re-blasting and priming again. Repair of pre-fabrication/pre-erection primer, if required, shall be done as per Table 7.2.
3. In case of Paint systems as per SL Nos. 9.5 and 9.6, the color bands shall be applied over the Aluminum paint as per the Color coding requirement for specific service of piping given in Clause 19.0.
4. All coating system including surface preparation, primer, and finish coat for piping shall be done at field only.



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**TABLE 10.0 COATING SYSTEM FOR UNIT AREAS AS WELL AS DM, CPP, COOLING TOWER OF INLAND PLANTS AND FOR ALL AREAS (UNIT, OFFSITE, DM, CPP, etc.) OF COASTAL PLANTS**

Sl. No.	Design Temp in °C	Surface Preparation & Pre-erection/Shop Primer	Coating System (Post-erection/Field)		Total Final DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
10.1	-90 to -15	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	None	65-75	a) No over-coating to be done on F-9 as it will lead to mud cracking. b) F-12 shall be ambient temperature curing type c) Finish coat including primer compatible with finish coat (i.e. field primer) shall be applied at site only. Finish coating is not permitted at equipment manufacture shop.
10.2	-14 to 80	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	1 coat of P-6 @ 4 DFT/coat	2 coats of F-6A @ 100 DFT/coat + 1 coat of F-2 @ 40 DFT/coat; (2x100+40=240)	345-355	
10.3	81 to 400	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	None	2 coats of F-12 @ 20 DFT/coat 2x20=40	105-115	
10.4	401 to 550	SSPC-SP-10; 1 coat of F-12 @ 20 DFT/coat	None	2 coats of F-12 @ 20 DFT/coat (2x20=40)	60	

**NOTES:**



- The list of items given in the heading of the above table is not exhaustive. There may be more items for a particular contract where these specifications are used. The Contractor is fully responsible for completing painting including prefabrication primer for all the items supplied and fabricated through his scope of work as per tender document.
- If the Pre-erection/Pre-fabrication & Shop Primer has already been completed, the same shall not be repeated again in the field. In case the damages of primer are severe and spread over large areas, the engineer-in-charge may decide & advise re-blasting and priming again. Repair of pre-fabrication/pre-erection primer, if required, shall be done as per Table 7.2.

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3. For external surface of MS chimney with or without refractory lining and for internal surface without refractory lining, paint system as per 10.3 above shall be followed.
4. For external surface of RCC Chimney, 2 coats of F-6 @ 100 $\mu$  DFT/coat to obtain total DFT of 200  $\mu$  shall be applied after proper surface preparation as per guidelines in 5.1.6.
5. In case of paint systems as per SL Nos. 10.3 and 10.4, the color bands shall be applied over the Aluminum paint as per the Color coding requirement for specific service of piping given in Clause 19.0.
6. All coating system including surface preparation, primer, and finish coat for piping shall be done at site/field only.

**TABLE 11.0 COATING SYSTEMS FOR EFFLUENT TREATMENT PLANT (ETP)**

Sl. No.	Design Temp. in °C	Surface Preparation	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
11.1	For Internal Surfaces of CS/MS Items: Bio-sludge sump, Filter feed sump, Process sump, Sanitary sump, Transfer sump, Sludge, Slop oil tank, scrapping mechanism in Clarifier					
	-14 to 80	SSPS-SP-10	1 coat of F-9 @ 65-75 DFT/coat	2 coats of F-6A @ 100 DFT/coat of F-2 @ 40 DFT/coat; (2x100+40+240)	305-315	
11.2	For Internal Surfaces of CS/MS Items: Bio-sludge sump, Filter feed sump, Process sump, Sanitary sump, Transfer sump, Sludge, Slop oil tank, scrapping mechanism in Clarifier					
	-14 to 80	SSPS-SP-10	1 coat of F-9 @ 65-75 DFT/coat	3 coats of F-6A @ 100 DFT/coat (3x100+300)	365-375	Note:1
11.3	All R.C.C./concrete surfaces exposed to effluent water / liquid such as tanks, structures, drains etc. in Process sump, TPI separator (Process and Oil), Aeration Tank and Transfer sump etc.					
	-14 to 80	Blast cleaning to SSPC-SP guide lines and Acid etching with 10-15% HCl acid followed by thorough	Epoxy Screed lining		3mm	Epoxy screed lining shall be applied as per specific manufacturer and Engineer-in-Charge instructions

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		water washing			
11.4	C.S/M.S Dual media filters (Internal), Chemical dosing tanks (internal) such as Di-Ammonium Phosphate (DAP) and Urea				
	Up to 60	SSPC-SP-10	Natural Rubber Lining (As per IS 4682, Part 1)	4.5mm	Natural Rubber lining shall be applied as per specific manufacturer and Engineer-in-Charge instructions

**NOTES :**

- The paint /coating manufacturers shall provide their Quality control test certificate of coating materials (F-6A) for immersion service of the exposed effluent given in 11.2.

**TABLE 12.0 EXTERNAL COATING SYSTEMS FOR UNINSULATED CARBON STEEL AND LOW ALLOY STEEL STORAGE TANKS (For all plant locations, coastal or inland)**  
**All Process Units & Off-sites**

Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
12.1	All external surfaces of shell, wind girders, appurtenances, roof tops of all above ground tank including top side of external and internal floating roof and associated external structural works					
12.1.1	-14 to 80	SSPS-SP-10	1 coat of F-9 @ 65-75 DFT/coat + 1 coat of P-6 @ 40 DFT/coat;	2 coats of F-6A @ 100 DFT/coat + 1 coat of F-2 @ 40 DFT/coat;	345-355	F-6 should be suitable for occasional water immersion
12.1.2	81 to 150	SSPS-SP-10	1 coat of F-15 primer @ 80 DFT/coat + 1 coat of F-15 intermediate coat @ 80 DFT/coat;	1 coat of F-15 finish coat @ 80 DFT/coat + 1 coat of F-2 @ 40 DFT/coat;	280	-



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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
12.1.3	151 to 500	SSPC-SP-10	1 coat of F-9 @ 65-75 DFT/coat	2 coats of F-12 @ 20 DFT/coat Or 1 coat of F-16 @ 50 DFT/coat	105 or 115	-
12.2	External surfaces of bottom plate (soil side) for all storage tanks					
12.2.1	-14 to 80	SSPC-SP-10	1 coat of F-9 @ 65-75 DFT/coat	3 coats of F-7 @ 100 DFT/coat (3x100=300)	365-375	F-7 should be suitable for immersion service of the products given
12.2.2	81 to 150	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat + 1 coat of F-15 intermediate coat @ 80 DFT/coat ; (80+80=160)	1 coat of F-15 finish coat @ 80 DFT/coat	240	-
12.2.3	151 to 550	SSPC-SP-10	1 coat of F-16 @ 125 DFT/coat	1 coat of F-16 @ 125 DFT/coat	250	-
12.3	For underside of the bottom plate (in case tank is not lifted during PWHT) (see Note 2c)					
12.3.1	-180 to 650	For CS SSPC SP-6 Commercial Blast For SS SSPC SP-1 with non-chloride solvent	1 coat of inert polymeric matrix coating @ 125	2 coats of inert polymeric matrix coating @ 125	350-400	Products form JOTUN or HI-TEMP coating or SK FORMULATION S are recommended

**NOTES:**

1. All paint coating application including primer for tankage shall be carried out at field after erection and completion of all welding.
2. For underside of bottom plate:
  - a) Painting shall be carried out before laying of bottom plate for tanks with Non-



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Post Weld Heat Treatment (PWHT).



- b) For tanks with PWHT, painting shall be carried out after PWHT.
- c) In case tank is not lifted during PWHT then painting shall be applied before laying of bottom plate, clause no. 12.3.1 shall be followed.

Caution: PWHT temperature shall not exceed 650°C.



**TABLE 13.0 INTERNAL COATING SYSTEMS FOR CARBON STEEL AND LOW ALLOY STORAGE TANKS**

**All Process Units & Off-sites**

Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
13.1	CRUDE OIL, ATF, TURPENTINE OIL, LUBRICATING OIL AND VEGETABLE OIL					
13.1.1	-14 to 90	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat + 1 coat of F-15 finish coat @ 80 DFT/coat;	240-300	-
13.2	PETROLEUM PRODUCTS & INTERMEDIATES like LDO, HSD, GAS OIL, FEEDS of FCC-PC, FCC-LCO, VGO-HDT, ISOM, DHDT, REFORMATE, DCU, NHT & GASOLINE, NAPHTHA, ISOMERATE AND KEROSENE. Underside of Floating roofs, internal surface of cone roof, inside of bottom plate, internal surfaces of Bare shell for full height, underside of floating roof, oil side surfaces of pontoons, support structures and ladders etc.					
13.2.1	-14 to 45	SSPC-SP-10	1 coat of F-9 @ 75 DFT/coat	-	75	Note-2
13.2.2	46 to 90	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat + 1 coat of F-15 finish coat @ 80 DFT/coat;	240-300	-
13.3	POTABLE AND FIRE WATER All internal surfaces, accessories and roof structures of Cone and Dome roof tanks					

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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
13.3.1	-14 to 45	SSPC-SP-10	1 coat of P-6 @ 100 DFT/coat	2 coats of F-6A @ 100 DFT/Coat; (2x100=200)	300-350	Note-4
13.4	DE-MINERALIZED (DM) WATER All internal surfaces, accessories and roof structures of Cone and Dome roof tanks					
13.4.1	-14 to 60	SSPC-SP-10	1 coat of P-6 @ 100 DFT/coat	2 coats of F-6C @ 200 DFT/coat; (2x200=400)	400-450	-
13.4.2	61 to 150	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat + 1 coat of F-15 finish coat @ 80 DFT/coat; (80+80=160)	240-300	-
13.5	HYDROCHLORIC ACID (HCl) 10% All internal surfaces, accessories and roof structures of Cone and Dome roof tanks					
13.5.1	-14 to 60	SSPC-SP-10	None	Natural Rubber Lining	4.5 mm	-
13.6	AGGRESSIVE SOLVENTS LIKE HEXANE, HEXENE, BENZENE, XYLENE AND TOLUENE All internal surfaces, accessories and roof structures of Cone and Dome roof tanks					
13.6.1	-14 to 65	SSPC-SP-10	1 coat of F-9 @ 75 DFT/coat	-	75	-
13.7	ETHYLENE GLYCOL (EG) TANKS Internal shell-full height, bottom plate, underside of roof and all accessories					
13.7.1	All	SSPC-SP-10	None	3 coats of vinyl chloride co-polymer AMERCOAT 23 @ 75/coat; (3x75+225)	225	-
13.8						
13.8.1	-14 to 90	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat + 1 coat of F-15	240	-

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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
				finish coat @ 80 DFT/coat; (80+80=160)		
13.10	<b>VACUUM RESIDUE, FUEL OIL, DRY SLOP, BITUMEN AND OTHER HIGH TEMPERATURE HYDROCARBON LIQUIDS</b> Underside of floating roof, internal surface of cone roof, bottom plate, inside of bare shell – including wetted and non wetted surfaces, oil side surfaces of deck plates, oil side surfaces of pontoons, roof structure, structural steel and ladders					
13.10.1	Up to 150°C	SSPC-SP-10	1 coat of F-17 primer @ 125 DFT/coat	1 coat of F-17 intermediate coat @ 125 DFT/coat + 1 coat of F-17 finish coat @ 125 DFT/coat; (125+125=250)	375	Note:3
13.11	<b>ALKALIS UP TO 505 CONCENTRATION</b> All internal surfaces, accessories and roof structures of Cone and Dome roof tanks					
13.11.1	Up to 60 °C	SSPC-SP-10	1 coat of F-15 primer @ 80 DFT/coat	2 Coats of F-6 A @ 100 DFT/coat; (2x100=200)	280-100	-



**NOTES:**

- All paint coating application including primer shall be carried out after erection and completion of all welding work at site.
- F-6A should be suitable and resistant for immersion service for the respective Hydrocarbons.
- This system can be used where maximum operating temperature is below 150°C and design temperature is up to 200°C. Cases of operating temperature > 150°C are not covered in this spec; such cases shall be covered in the job specifications.
- F-6 A shall be suitable for drinking water service and should have competent authority certification.

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**TABLE 14.0 COATING SYSTEMS FOR EXTERNAL SIDE OF UNDERGROUND CARBON STEEL PLANT PIPING AND UNDERGROUND VESSELS.**



Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
<b>14.1</b>	<b>Underground carbon steel plant piping</b>					
14.1.1	25 to 35	-	SSPC-SP-10; 1 coat of synthetic fast drying primer 25 @ DFT/coat	1 layer of coaltar tape coating @ 2mm + 1 coat of synthetic fast drying primer 25 @ DFT/coat + 1 layer of coal tar tape coating @ 2mm/layer as per EIL Standard Specification No.6-79-0011	4 mm	The primer DFT is not measurable Reconciliation primer shall be done by coverage of maximum to sq.m/litre
14.2.1	66 to 150	-	SSPC-SP-10; 1 coat of F-17 primer @ 125 DFT/coat	1 coat of F-17 intermediate coat @ 125 DFT/coat + 1 coat of F-17 finish coat @ 125 DFT/coat	375	-
14.2.2	151 to 400	-	SSPC-SP-10; 1 coat of F-16 primer @ 125 DFT/coat	1 coat of F-16 finish coat @ 125 DFT/coat	250	-
<b>14.3</b>	<b>External side of un-insulated underground storage vessels</b>					
14.3.1	-40 to 80	SSPC-SP-10; 1 coat of F-9 @ 65-75 DFT/coat	-	3 coats of F-7 @ 100 DFT/coat	365-375	-

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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
14.3.2	81-150	SSPC-SP-10; 1 coat of F-17 primer @ 125 DFT/coat	-	1 coat of F-17 intermediate coat @ 125 DFT/coat + 1 coat of F-17 finish coat @ 125 DFT/coat	375	-
14.3.3	151-400	SSPC-SP-10; 1 coat of F-16 primer @ 125 DFT/coat	-	1 coat of F-16 finish coat @ 125 DFT/coat	250	-

**TABLE 15.0 COATING UNDER INSULATION (COASTAL OR INLAND PLANTS).  
ALL UNITS AREAS & OFF-SITES  
For insulated Piping, Equipments, Storage vessels, tanks, Columns etc  
of Carbon Steel, LTCS, Low Alloy Steel & Stainless Steels.**

Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
<b>15.1</b>	<b>Carbon steel, LTCS and low Alloy steel Piping</b>					
15.1.1	-45 to 120	SSPC-SP-10; 1 coat of F-15 @ 75 DFT/coat	1 coat of F-15 @ 75 DFT/coat	2 coats of F-15 @ 75 DFT/coat; (2x75=150)	225-250	-
15.1.2	121-540	SSPC-SP-10; 1 coat of F-12 @ 20 DFT/coat	None	2 coat of F-12 @ 20 DFT/coat; (2x2=40)	60	-

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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
<b>15.2</b>	<b>Carbon steel, LTCS and low Alloy steel – Storage vessels, Reactors, Columns &amp; Equipments</b>					
15.2.1	-45 to 120	SSPC-SP-10; 1 coat of F-15 @ 75 DFT/coat	1 coat of F-15 @ 75 DFT/coat	2 coats of F-15 @ 75 DFT/coat (2x75+150)	225-250	-
15.2.2	121 to 540	Temporary oil based varnish coatings to be provided for transport and storage	Thermally Sprayed Aluminium coating (TSAC) Refer ANNEXURE-I		-	-
<b>15.3</b>	<b>Stainless Steel (SS) including Alloy-20 piping (Note:2)</b>					
15.3.1	-180 to Zero	For CS SSPC SP-6 Commercial Blast	1 coat of inert polymeric matrix coating @ 125	2 coats of inert polymeric matrix coating @ 125	350-400	Products from JOTUN or HI-TEMP coatings or SK FORUMATIONS are recommended
15.3.2	0 to 125	SSPC-SP-10 (15-25 surface profile) 1 coat of F-15 @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat	1 coat of F-15 finish coat @ 80 DFT/coat;	240	If the piping & equipments are already erected then surface shall be prepared by cleaning with emery paper and wash/flush with chloride free DM water followed by wiping with organic solvent
15.3.3	126 to 400	SSPC-SP-10 1 coat of F-16 @ 125 DFT/coat	None	1 coat of F-16 @ 125 DFT/coat	250	Not recommended for operating temperature
15.3.4	401 to 600	SSPC-SP-10; 1 coat of Amercoat 738 @ 125 DFT/coat	None	1 coat of Amercoat 738 @ 125 DFT/coat	250	Between 60-120°C
<b>15.4</b>	<b>Coating system for Cyclic Service of Carbon Steel, LTCS, Low Alloy Steel &amp; Stainless Steel</b>					

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Sl. No.	Design Temp. in °C	Surface Preparation (Field)	Coating System		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
15.4.1	-40 to 150	SSPC-SP-10 (15-25 surface profile) 1 coat of F-15 @ 80 DFT/coat	1 coat of F-15 intermediate coat @ 80 DFT/coat	1 coat of F-15 finish coat @ 80 DFT/coat;	240	Apcothern EPN 200 of M/s Asian Paints Ltd OR Equivalent
15.4.2	- 180 to 650	For CS SSPC SP-6 Commercial Blast For SS SSPC-SP-1 with non-chloride solvent	1 coat of inert polymeric matrix coating @ 125	2 coats of inert polymeric matrix coating @ 125	350-400	Products from JOTUN or HI-TEMP coatings or SK FORMULATIONS are recommended
<b>15.5</b>	<b>No painting is required for insulated Monel, Incoloy and Nickel Lines</b>					

**NOTES:**



- "Cyclic Service" is characterized by rapid temperature fluctuation.
- The blast cleaning abrasives for SS and Alloy steel surfaces shall be Aluminum oxide grits/shots or garnet.
- In case of overlapping of temperature ranges as mentioned in 15.4.1 and 15.4.2, clause 15.4.1 shall be followed.

**TABLE 16.0 COATING SYSTEM FOR CARBON STEEL COMPONENTS OF COOLERS I CONDENSERS (INTERNAL PROTECTION) FOR FRESH WATER SERVICE**

Fresh Water boxes, channels, partition plates, end covers and tube sheets etc.

Sl. No.	Design Temp. in °C	Surface Preparation & Pre-	Coating System (Post-erection / Field)		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		



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		erection/Sho p Primer				
16.1	Up to 80 °C	SSPC-SP-10	1 coat of F-15 @ 80 microns	2 coats of F-15 @ 80 DFT/coat;	240	-
16.2	80 to 140	SSPC-SP-10	-	1 coat of Glass Fibre Reinforced Novolac epoxy of 1.5 mm DFT	1500	-

**TABLE 17.0 COATING SYSTEM (INTERNAL PROTECTION) FOR GALVANIZED OR NON FERROUS OR STAINLESS STEEL/DUPLEX STAINLESS STEEL COMPONENTS OF COOLERS/ CONDENSERS FOR FRESH WATER SERVICE**



Sl. No.	Design Temp. in °C	Surface Preparation & Pre-erection/Sho p Primer	Coating System (Post-erection / Field)		Total DFT in Microns (min.)	Remarks
			Primer	Finish Coat		
17.1	Up to 80	Sweep Blasting	1 coat of F-15 @ 80 DFT/coat;	1 coat of F-15 @ 80 DFT/coat;	160	-
17.2	80 to 140	Sweep Blasting	-	1 coat of Glass Fibre Reinforced Novolac epoxy of 1.5 mm DFT	1500	-

## 18.0 STORAGE

**18.1** All paints and painting materials shall be stored only in rooms to be arranged by contractor and approved by Engineer-in-charge for the purpose. All necessary precautions shall be taken to prevent fire. The storage building shall preferably be separate from adjacent building. A signboard bearing the word "PAINT STORAGE - NO NAKED LIGHT - HIGHLY INFLAMABLE" shall be clearly displayed outside. Manufacturer's recommendation shall be followed for storage of paint materials.

## 19.0 COLOUR CODE

The following color coding system shall be followed. However alternate color coding may also be followed as per Owner's color coding practice/scheme.



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## 19.1 IDENTIFICATION



The system of color coding consists of a ground color and secondary color bands superimposed over the ground color. The ground color identifies the basic nature of the service and secondary color band over the ground color distinguishes the particular service. The ground color shall be applied over the entire length of the un-insulated pipes. For insulated lines ground color shall be provided as per specified length and interval to identify the basic nature of service and secondary color bands to be painted on these specified length to identify the particular service. Above color code is applicable for both unit and offsite pipelines.

## COLOUR CODING



SR. No.	SERVICE	RECOMMENDED COLOUR FOR PAINT SYSTEM	RAL COLOUR CODE			
			BASE COLOUR		BAND COLOUR	
<b>HYDROCARBON LINES (UNINSULATED)</b>						
1	CRUDE SOUR	Dark Admiralty grey with 1 orange band	7012		2011	
2	CRUDE SWEET	Dark Admiralty grey with 1 red band	7012		3001	
3	LUBE OILS	Dark Admiralty grey with 1 green band	7012		6010	
4	FLARE LINES	Heat Resistant Aluminium	9006			
5	LPG	Orange with 1 oxide red band	2011		3009	
6	PROPYLENE	Orange with 2 blue bands	2011		5013	
7	NAPHTHA	Orange with 1 green band	2011		6010	
8	M.S.	Orange with 1 dark admiralty grey band	2011		7012	
9	A.V. GASOLINE (96 RON)	Orange with 1 band each of green, white and red bands	2011	6010	9010	3001
10	GASOLINE (regular, leaded)	Orange with 1 black band	2011		9005	
11	GASOLINE (premium, leaded)	Orange with 1 blue band	2011		5013	
12	GASOLINE (white)	Orange with 1 white band	2011		9010	
13	GASOLINE (Aviation 100/130)	Orange with 1 red band	2011		3001	
14	GASOLINE (Aviation 115/145)	Orange with 1 purple band	2011		4006	
15	N-PENTANE	Orange with 2 blue bands	2011		5013	

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			BASE COLOUR	BAND COLOUR
16	DIESEL OIL (White)	Oxide red with 1 white band	3009	9010
17	DIESEL OIL (Black)	Oxide red with 1 yellow band	3009	1023
18	KEROSENE	Oxide red with 1 green band	3009	6010
19	HY. KEROSENE	Oxide red with 2 green bands	3009	6010
20	DISULFIDE OIL (EX-MEROX)	Oxide red with 1 black band	3009	9005
21	M.T.O.	Oxide red with 3 green bands	3009	6010
22	DHPPA	Oxide red with 2 white bands	3009	9010
23	FLUSHING OIL	Oxide red with 2 black bands	3009	9005
24	LAB FS	Oxide red with 2 dark admiralty grey bands	3009	7012
25	LAB RS	Oxide red with 3 dark admiralty grey bands	3009	7012
26	LAB (Off. Spec)	Oxide red with 1 light grey band	3009	7035
27	N-PARAFFIN	Oxide red with 1 blue band	3009	5013
28	HEAVY ALKYLATE	Oxide red with red band	3009	3001
29	BELOW DOWN. VAPOR LINE	Off white / Aluminum with 1-Brown band	9006	8004
30	BLOWDOWN	Off white /Aluminum with 2 brown bands	9006	8004
31	A.T.F.	Leaf brown with 1 white band	8003	9010
32	TOULENE	Leaf brown with 1 yellow band	8003	1023
33	BENZENE	Leaf brown with 1 green band	8003	6010
34	LAB PRODUCT	Leaf brown with 1 blue band	8003	5013
35	FUEL OIL	Black with 1 yellow band	9005	1023
36	FUEL OIL (Aromatic rich)	Black with 2 yellow bands	9005	1023
37	ASPHALT	Black with 1 white band	9005	9010
38	SLOP AND WASTE OILS	Black with 1 orange band	9005	2011
39	SLOP AROMATICS	Black with 2 orange bands	9005	2011
<b>CHEMICAL LINES</b>				
40	TRI-SODIUM PHOSPHATE	Canary yellow with 1 violet band	1012	5000
41	CAUSTIC SODA	Canary yellow with 1 black band	1012	9005
42	SODIUM CHLORIDE	Canary yellow with 1 white band	1012	9010
43	AMMONIA	Canary yellow with 1 blue band	1012	5013

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			BASE COLOUR	BAND COLOUR
44	CORROSION INHIBITOR	Canary yellow with 1 Aluminum band	1012	9006
45	HEMAMETA PHOSPHATE	Canary yellow with 2 black bands	1012	9005
46	ACID LINES	Golden Yellow with 1 red band	1012	3001
47	RICH AMINE	Canary yellow with 2 blue bands	1012	5013
48	LEAN AMINE	Canary yellow with 3 blue bands	1012	5013
49	SOLVENT	Canary yellow with 1 green band	1012	6010
50	LCS	Canary yellow with 1 smoke grey	1012	7031
<b>WATER LINES</b>				
51	RAW WATER	Sky blue with 1 black band	5015	9005
52	INDUSTRIAL WATER	Sky blue with 2 signal red band	5015	3001
53	TREATED WATER	Sky blue with 1 oxide red band	5015	3009
54	DRINKING WATER	Sky blue with 1 green band	5015	6010
55	COOLING WATER	Sky blue with 1 light brown band	5015	1011
56	SERVICE WATER	Sky blue with 1 signal red brown	5015	3001
57	TEMPERED WATER	Sky blue with 2 green bands	5015	6010
58	DM WATER	Sky blue with 1 aluminum band	5015	9006
59	DM WATER ABOVE 150° F	Sky blue with 2 black bands	5015	9005
60	SOUR WATER	Sky blue with 2 yellow bands	5015	1013
61	STRIPPED WATER	Sky blue with 2 blue bands	5015	5013
62	ETP TREATED WATER	Sky blue with 2 oxide red bands	5015	3009
<b>FIRE PROTECTION SYSTEM (ABOVE GROUND)</b>				
63	FIRE WATER FOAM & EXTINGUISHERS	Post office red	3002	
<b>AIR &amp; OTHER GAS LINES (UNINSULATED)</b>				
64	SERVICE AIR	Sea green with 1 signal red band	6018	3001
65	INSTRUMENT AIR	Sea green with 1 black band	6018	9005
66	NITROGEN	Sea green with 1 orange band	6018	2011
67	FREON	Sea green with 1 yellow band	6018	1023
68	CHLORINE	Canary yellow with 1 oxide band	1012	3009
69	SO <sub>2</sub>	Canary yellow with 2 white bands	1012	9010
70	H <sub>2</sub> S	Orange with 2 red oxide bands	2011	3009
71	GAS (Fuel)	Orange with 1 aluminum band	2011	9006

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			BASE COLOUR	BAND COLOUR
72	GAS (Sour)	Orange with 2 aluminum bands	2011	9006
73	GAS (Sweet)	Orange with 2 signal red band	2011	3001
74	HYDROGEN	Orange with 1 light green band	2011	6021
<b>STEAM AND CONDENSATE LINES (UNINSULATED)</b>				
75	HP STEAM	Off white / Aluminum with 1 yellow band	9006	1023
76	MP STEAM	Off white / Aluminum with 1 red band	9006	3001
77	MLP STEAM	Off white / Aluminum with 1 orange band	9006	2011
78	LP STEAM	Off white / Aluminum with 1 light green band	9006	6021
79	CONDENSATE	Sky blue with 1 white band	5015	9010
80	CONDENSATE ABOVE 150° F	Sky blue with 3 oxide red band	5015	3009
81	BFW	Sky blue with 2 red bands	5015	3001
Note : For all insulated steam lines, the colour coding shall be follow as given for un-insulated lines with the specified length of color bands.				
<b>INSULATED HYDROCARBON PIPING</b>				
82	IFO SUPPLY	1 Black ground colour with 1 yellow band in centre	9005	1023
83	IFO RETURN	Black ground colour with 1 green band in centre	9005	6010
84	HPS	Black ground colour with 1 red band in centre	9005	3001
85	BITUMEN	Black ground colour with 2 red bands in centre	9005	3001
86	CLO	Black ground colour with 1 brown band in centre	9005	8004
87	VB TAR	Black ground colour with 1 blue band in centre	9005	8004
88	VR AM (BITUMEN / VBU FEED)	1 Black ground colour with 2 blue bands in centre	9005	5013
89	VR BH	1 Black ground colour with 2 blue bands in centre	9005	5013
90	VAC. SLOP	1 Black ground colour with 1 white band in centre	9005	9010
91	SLOP	1 Black ground colour with 1 orange band in centre	9005	2011

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SR. No.	SERVICE	RECOMMENDED COLOUR FOR PAINT SYSTEM	RAL COLOUR COADE	
			BASE COLOUR	BAND COLOUR
92	CRUDE SWEET	1 Dark admiralty grey ground colour with 1 red band in centre	7012	3001
93	CRUDE OIL	1 Dark admiralty grey ground colour with 1 orange band in centre	7012	2011
94	VGO/ HCU	1 Oxide red ground colour with 2 steel grey bands in centre	3009	7011
95	OHCU BOTOM / FCCU FEED	1 Oxide red ground colour with 2 steel grey bands in centre	3009	7011
<b>UNINSULATED EQUIPMENTS, TANKS AND STRUCTURES</b>				
96	HEATER STRUCTURE	Steel grey	7011	
97	HEATER CASING	Heat resistant aluminium	9006	
98	VESSELS & COLUMNS	Aluminium	9006	
99	HYDROGEN BULLETS	Pink	3014	
100	LPG VESSELS	Oxide red	3009	
101	SO2 VESSEL	Canary yellow	1012	
102	HEAT EXCHANGER	Heat resistant aluminium	9006	
103	FO TANK AND HOT TANKS	Black	9005	
104	ALL OTHER TANKS	Aluminum / Off white	9006	
		Golden yellow	1004	
106	SOUR WATER	Sky Blue	5015	
107	OUTER SURFACE IN BOILER HOUSE	Heat resistant aluminum	9006	
108	COMPRESSORS AND BLOWERS	Dark admiralty grey	7012	
109	PUMPS	Navy blue	5014	
110	MOTORS & SWITCH GEAR	Bluish green	5024	
111	HAND RAILING	Signal red	3001	
112	STAIRCASE, LADDER AND WALKWAYS	Black	9005	
113	LOAD LIFTING EQUIPMENT AND MONORAILS ETC	Leaf brown	8003	

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			BASE COLOUR	BAND COLOUR
114	GENERAL STRUCTURE	Black	9005	
<b>PIPES AND FITTINGS OF ALLOY STEEL AND SS MATERIAL IN STORE</b>				
115	IBR	Signal red	3001	
116	9Cr-1Mo	Verdigris green	6021	
117	5Cr-0.5Mo	Satin blue	5012	
118	2 ¼ Cr-1Mo	Aircraft yellow	1026	
119	1 ¼ Cr-Mo	Traffic Yellow	1023	
120	SS-304	Dark blue grey	5008	
121	SS-316	Dark violet	4005	
122	SS321	Navy blue	5014	
<b>SAFETY COLOUR SCHEMES</b>				
123	DANGEROUS OBSTRUCTION	Black and alert orange band	9005	2008
124	DANGEROUS OR EXPOSED PARTS OF MACHINERY	Alert orange	2008	

Note: All LPG service PSVs shall be painted Deep Blue.

All drains & Vents shall be painted in Main line color.

The color code scheme is for identification of piping service group, It consists of a ground color and 1 / 2 color bands.

## 19.2 Ground Color

On uninsulated pipes, the entire pipe has to be painted in ground color., and on metal cladded insulated lines, minimum 2M long portion should be painted.



## 19.3 Color Bands

*Location of color bands:*

- At Battery Limits
- Intersection points & change of direction points in piping
- Midway of piping section, near valves, across culverts
- At 50 M interval on long stretch pipes
- At starting and termination points.

*Minimum width:*



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<u>NB</u>	<u>Width</u>
3" and below	75mm
Above 3" to 6"	NB X 25MM
Above 6" to 12"	NBX 18MM
Above 12"	NBX 15 MM

!!! Note: For insulated pipes, NB indicates OD of the insulation.

#### **Sequence:**

Color bands shall be arranged in sequence showing Table above and the sequence follows the direction of flow. The width of the 1<sup>st</sup> Band to 2nd band is 4:1,

#### **!!! Note:**

Wherever deemed required by Process Department or Safety, pipes handling hazardous substances will be given hazard marking of 30 mm wide diagonal stripes of Black and Golden Yellow as per IS : 2379.

#### **19.4 Special Camouflage Painting for Uninsulated Crude and Product Storage Tanks.**

Paint specification shall be as per standards.

Camouflage painting scheme for Defense requirement in irregular patches will be applied with 3 colors

Dark Green	Light green	Medium Brown
5	3	2

The patches shall be irregular and asymmetrical and inclined at 30 to 60 Degrees.



Patches should be continuous at surface meeting lines / points.

Slits / holes shall be painted in dark green shade.

Width of patches shall be 1 to 2 meters.

#### **19.5 Identification Markings on Equipment / Piping**

Equipment tag Numbers shall be Stenciled / neatly painted using normal 'Arial' Lettering Style on all equipment and piping (Both insulated & uninsulated) after

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completion of all paint works. Lettering colour shall be either BLACK or WHITE, depending upon the background, so as to obtain good contrast.

Operations Group shall specify location

Sizes shall be:

Columns, Vessels, Heaters:	150mm
Pumps and other M/c	50 mm
Piping	OD I 2 with Maximum I 00 MM
Storage Tanks	(As per Drawings)



#### 19.6 Color Coding for Control Valve

- |                      |                 |
|----------------------|-----------------|
| a) Carbon Steel Body | - Light grey    |
| Alloy Steel Body     | - Canary yellow |
| Stainless Steel Body | - Natural       |
- b) The actuator of the Control valve shall be painted as :
- |  |         |
|--|---------|
| Direct action (open on air failure) valves   | - Green |
| Reverse acting (close on air failure) valves | - Red   |

The painting Status shall be comprehensively updated every 6 months for compliance.

#### 19.7 Colour Coding for Structural & Others

Sl. No	Item	Color	Indicative
1	Pipe rack structurals	Dark Admiralty Grey	
2	Chequered Plate (Both faces)	Black	
3	Grating	Black	
4	Ladder Rungs & Railing Vertical Posts	Black	
5	Hand Rail, Middle rail, Toe Plate	Signal Red	
6	Ladder Vertical Posts	Signal Red	
7	Building Structural, Steel Columns, brackets, beams, bracings, roof trusses, purlings, side girts, louvers, stringers	Dark Admiralty Grey	
8	OverHead Monorail	Signal Red	
9	Gantry Girder & Monorail	Dark Green	
10	Monorail Stopper Plates	Signal Red	
11	Coke Cutting System	Signal Red	

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Sl. No	Item	Color	Indicative
12	EOT/HOT Cranes	Canary Yellow	
13	Transformers & Battery room structurals	Dark Admiralty Grey	
14	Electrical Motors	Dark Blue	

## 20.0 IDENTIFICATION OF VESSELS, PIPING ETC

**20.1** Equipment number shall be stencilled in black or white on each vessel, column, equipment & machinery (insulated or uninsulated) after painting. Line number in black or white shall be stencilled on all the pipe lines of more than one location as directed by Engineer-In-Charge; Size of letter printed shall be as below:

Column & Vessels	150mm (high)
Pump, compressor & other machinery	50mm (high)
Piping	40-150 mm

### 20.2 Identification of Storage Tanks



The storage tanks shall be marked as detailed in the drawing.

## 22.0 QUALITY CONTROL, INSPECTION AND TESTING

**22.1** All painting materials including primers and thinners brought to site by contractor for application shall be procured directly from manufactures as per specifications and shall be accompanied by manufacturer's test certificates. Paint formulations without certificates are not acceptable (see section 24.0).

**22.2** The contractor must produce Test Certificate from Pre Qualified Paint Manufacturer for various tests as detailed out in section 25.1 of this document, for each batch & for each category of product. The Engineer-in-Charge shall have the right to test wet samples of paint from each batch at random for verifying quality of paint supplied. Contractor shall arrange to have such tests, when called for by Engineer-in-Charge, performed at his cost any one of the independent laboratories listed in the 25.1 of this document.

Samples for the test will be drawn at random in presence Engineer-in-Charge or his representations. Following tests to be carried out if called for by Engineer-in-Charge:

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Specific Gravity

% solids by weight (% zinc content in case of inorganic or organic zinc primer)

Drying time (touch dry & full curing)

Adhesion

Flexibility

Hardness

Storage stability (pot life)

Test methods for above tests shall be as per relevant ASTM or ISO Standard.



**22.3** The painting work shall be subject to inspection by Engineer-In-Charge at all times. In particular, following stage-wise inspection will be performed and contractor shall offer the work for inspection and approval of every stage before proceeding with the next stage. The record of inspection shall be maintained in the registers. Stages of inspection are as follows:

- (a) Surface preparation
- (b) Primer application
- (c) Each coat of paint

**During surface preparation, following tests are to be carried out:**

- Test for absence oil & grease after degreasing before blasting as per procedure given in sec 6.7 of Annexure-I of this specification (specification for thermally sprayed Aluminium Coating).
- Tests for surface finish of blasted surface shall be done by visual inspection using SSPC- VIS 1. Clear cellophane tape test as per ISO 8502-3 shall be used to confirm absence of dust on blasted surface. Checks shall be done on each component at least once per 200 m<sup>2</sup> of blasted surface and minimum of 3 checks per shift.
- Test for presence of soluble salt as per method ISO 8502-9. Maximum allowable salt content shall be considered 20 mg/m<sup>2</sup> (2 mg/cm<sup>2</sup>), Checks shall be done on each component at least once per 200 m<sup>2</sup> of blasted surface and minimum of 3 checks per shift. In case salt exceeds specified limit, the contaminated surface shall be cleaned by method as per Annexure-C of IS 12944-4 (water cleaning). After cleaning surface shall be retested for salt after drying.
- Blast profile measurement +This shall be done as described in sec 6.2 of Annexure-I of this specification (Specification for thermally sprayed Aluminum).
- Test for blasting Media and Blasting air- this shall be done as described in sec 6.6 of Annexure-I of this specification (Specification for thermally sprayed Aluminum).

In addition to above, record should include type of shop primer already applied on equipment e.g., zinc silicate, or zinc rich epoxy, or zinc phosphate.

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Any defect noticed during the various stages of inspection shall be rectified by the contractor to the entire satisfaction of Engineer-In-Charge before proceeding further. Irrespective of the inspection, repair and approval at intermediate stages of work, contractor shall be responsible for making good any defects found during final inspection/guarantee period/defect liability period as defined in general condition of contract. Dry film thickness (OFT) shall be checked and recorded after application of each coat and extra coat of paint should be applied to make-up the OFT specified without any extra cost to owner, the extra coat should have prior approval of Engineer-in-charge.

#### **22.4 Primer Application**

After surface preparation, the primer should be applied to cover the crevices, corners, sharp edges etc. in the presence of inspector nominated by Engineer-In-Charge.



**22.5** The shades of successive coats should be slightly different in color in order to ensure application of individual coats, the thickness of each coat and complete coverage should be checked as per provision of this specification. This should be approved by Engineer-In-Charge before application of successive coats.

**22.6** The contractor shall provide standard thickness measurement instrument with appropriate range(s) for measuring.

Dry film thickness of each coat, surface profile gauge for checking of surface profile in case of sand blasting. Holiday detectors and pinhole detector and protector whenever required for checking in case of immersion conditions.

**22.7** Prior to application of paints on surfaces of chimneys, the thickness of the individual coat shall be checked by application of each coat of same paint on M.S.test panel. The thickness of paint on test panels shall be determined by using gauge such as 'Elkometer'. The thickness of each coat shall be checked as per provision of this specification. This shall be approved by Engineer-In-Charge before application of paints on surface of chimney.

**22.8** At the discretion of Engineer-In-Charge, the paint manufacturer must provide the expert technical service at site as and when required. This service should be free of cost and without any obligation to the owner, as it would be in the interest of the manufacturer to ensure that both surface preparation and application are carried out as per their recommendations. The contractor is responsible to arrange the same.

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**22.9 Final inspection of finished coating shall consist of measurement of:**

- 1) Paint dry film thickness (DFT),
  - 2) Adhesion, and,
  - 3) Holiday detection check as well as for finish and workmanship.
- 1) Coating DFT measurement shall be as per ISO 2808. Type II electromagnetic gauges should be used for ferrous substrates. OFT gauge calibration, number of measurement shall be as per SSPC-DA 2. Measured OFT shall be within + 10% of the dry film thickness, specified in the specifications.
  - 2) Adhesion of the primer to the steel substrate and intercoat adhesion of the subsequent coat(s) after curing for at least a week after application of the topcoat shall be examined by a knife test in accordance with ASTM D 6677. For the knife test, if the rating is better than 8, the adhesion is considered acceptable. The adhesion is destructive and tested areas shall be repaired afterward using the spot repair procedure. Alternatively, the applicator may perform the adhesion test on a steel coupon coated using the same surface preparation and coating application procedure as the work piece. Adhesion testing shall be carried out for each component at least once per 200 m<sup>2</sup> (2000 ft<sup>2</sup>) of coated surface.
  - 3) Holiday testing shall be conducted in accordance with NACE SP 0188. For immersion services, 100% of coated area shall be inspected for holidays. For atmospheric exposure, 10% of coated area which must include weld seams, corners and edges to be holiday tested. Voltage at which test is to be carried out will depend upon OFT of coating being tested and shall be as per NACE SP 0188. Any holiday is unacceptable and should be marked and repaired immediately.

**22.10** The contractor shall arrange for spot checking of paint materials for Specific gravity, glow time (ford cup) and spreading rate.

**22.11 Final Inspection of coating system**



A final inspection shall be conducted prior to the acceptance of the work. The coating contractor and the facility owner shall both be present and they shall sign an agreed inspection report. Such reports shall include:

**General**

- Names of the coating contractor and the responsible personnel
- Dates when work was performed

**Coating Materials**

- Information on coating materials being applied
- Condition of coating materials received

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#### Environmental Conditions

- Weather and ambient conditions
- Coating periods

#### Surface Preparation

- Condition of surface before preparation
- Tools and methods used to prepare surface
- Condition of surface after preparation

#### Coating Application

- Equipment used
- Mixing procedure prior to application
- Coating application techniques use

#### Testing

- Type and calibration of inspection instruments used
- Type of quality control tests performed, and results.

### **23.0 GUARANTEE**

- 23.1** The contractor shall guarantee that the chemical and physical properties of paint materials used are in accordance with the specifications contained herein/to be provided during execution of work.



### **24.0 QUALIFICATION CRITERIA OF PAINTING CONTRACTOR / SUB CONTRACTOR**

Painting contractor who is awarded any job for MRPL, Projects under this standard must have necessary equipments, machinery, tools and tackles for surface preparation, paint application and inspection. The contractor must have qualified, trained and experienced surface preparator, paint applicator, inspector and supervisors. The contractor supervisor, inspector, surface preparator and paint applicator must be conversant with the standards referred in this specification.

### **25.0 QUALIFICATION/ACCEPTANCE CRITERIA FOR PAINT COATING SYSTEM**

- 25.1** Pre-Qualification of Paint Coating Manufacturer and his Products





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Paint Coating manufacture meeting the following requirements shall be considered for supply of their products. Contractor is advised to select coating manufacturer. Only after obtaining prequalification from MRPL for the manufacturer based on following requirements. Even those manufacturers, whose names are appearing elsewhere in the tender document, under the list of MRPL Recommended or Approved Vendors", will also be required to meet the following prequalification requirements.

- Manufacturer should have been in continuous business of paint coating formulation and manufacturer for at least past 5 years.
- Manufacturer should possess past experience of supplying his products to hydrocarbon processing industry or offshore platforms in the past 5 years.
- Coating manufacturer should have supplied at least 10000 liter of an individual product to hydrocarbon processing industry or offshore platform.
- The manufacturer's manufacturing procedure & QA/QC system shall meet ISO 9001 requirements and preferably should possess ISO 14000 certificate.
- The Quality control set up should be manned by qualified paint technologists whose bio data should be sent along with quality control organization chart.
- Pre-Qualification Testing:
  - Manufacturer should have got his products tested at least one time in last 3 years at a reputed independent laboratory for the following test items. Test certificates which are more than 3 years old will not be considered.

<b>Test</b>	<b>Test Method</b>
Specific gravity	ASTM D 1475
Dipping properties	ASTM D 823
Film characteristics	-
Solids content by weight	ASTM D 2369
Drying time	ASTM D 1640
Flexibility	ASTM D 1737/ D 522
Hardness	ASTM D 3363
Adhesion	ASTM D 2197
Abrasion resistance	ASTM D 968/ D 1044
DFT/coat	As per SSPC guidelines
Storage Stability	ASTM D 1849
Resistance to moisture vapour permeability for 2000 hrs	ASTM D 2247
Cyclic Test for the duration of 4200 h (25 cycles a 168 hours)	ISO 7253, ASTM G53

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<b>Test</b>	<b>Test Method</b>
% Zn in Dry film for Inorganic Zinc Silicate primer	-
Chemical Resistance test - 10% & 40% NaOH (applicable only for F-6 & F-15) - 10% H <sub>2</sub> SO <sub>4</sub> (applicable only for F-6 & F-15) - 10% Nitric Acid test (applicable only for F-6 & F-15) - Benzene / Toluene (applicable only for F-6 & F-15) - Kerosene (applicable only for F-6 & F-15) - Sea water (applicable only for F-6 & F-15) - MIBK test (applicable only for F-6 & F-15)	ASTM D 543
Resistance to water using water immersion (applicable only for F-6, F-7, F-8, F-14 & F-15)	ASTM D 870
Dry Heat Resistance test (applicable only for F-9, F-6A/B, F-2, F-15, F-16, polysiloxane, heat resistance Al silicone)	
Thermal shock resistance test (only for F-9, F-6, polysiloxane)	ASTM D2485 - 91

Each coating product to be qualified shall be identified by the following



1. An infrared scan (fingerprint), for Part A and B, each component as per ASTM D262
2. Specific gravity of Base and curing agent (Ref. ISO 2811)
3. Ash content (ASTM D1650), volatile and non-volatile matters (ISO 3251) of Each component

The identification shall be carried out on the batch, which is used for the Pre-qualification testing. Pre-qualification of the products shall be carried out at an independent laboratory.

Test shall be carried out at any one of the following laboratories and tests to be witnessed & certified by third party inspection agency (TUV, BY, DNV).

IICT, Hyderabad  
 HBTI, Kanpur  
 DMSRDE, Kanpur  
 BIS Laboratories  
 UICT, Matunga, Mumbai  
 RITES, Kolkata  
 PDIL, Sindri  
 NTH, Kolkata

Contractor shall furnish to MRPL for approval/ acceptance of all necessary documents/information including test certificates to prove that the paint

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manufacturers, from whom he intends to procure paint products, meet the various requirements for fulfilling the pre-qualification criteria as given under section 25.1 above. The paint manufacturer shall be qualified and approved for supply after review/assessment of the submission made by the contractor.

## 25.2 Information to be furnished during delivery of coating system:

Contractor along with delivery of paint material has to furnish following information from paint manufacturer to MRPL for acceptance/approval of products.

### a) Batch test certificates (Batch Testing)

Along with delivery to site of the paint products from pre-qualified coating manufacturer. Contractor has to produce test certificate from paint manufacturer for each batch and for each category of product for the following test items. Test to be witnessed & certified by third party inspection agency. All test results must mention clearly the batch no. and category of product tested. Tests to be conducted for following properties:

- Infrared scan for Part A and B, each component
- Specific Gravity
- % solids by weight (% zinc content in case of inorganic or organic zinc primer)

### b) Product information sheet/ technical data sheet for each category of product.



## 26.0 METHOD OF SAMPLING & DISPATCH FOR LABORATORY TESTING

(Pre-Qualification tests (sec. 25.1), Batch testing (sec. 25.2) and Inspection testing (sec. 22.0))



**26.1** Samples of coating materials should be submitted to the Govt. laboratory in sealed containers with batch no. and test certificate on regular format of manufacturer's testing laboratory. The sampling shall be certified and sealed by a certifying agency.

**26.2** All test panels should be prepared by Govt. testing agency colored photographs of test panels should be taken before and after the test and should be enclosed along with test report.

Sample batch no. and manufacturer's test certificate should be enclosed along with the report. Test report must contain details of observation and rusting if any, as per the testing code.

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- 26.3** Manufacturers should intimate the company, details of sample submitted for testing, name of Govt. testing agency, date, contact personnel of the govt. testing agency. At the end of the test the manufacturer should submit the test reports to the company for approval.
- 26.4** Coating systems for panel test shall be decided after discussion with MRPL.

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## ANNEXURE-I

### SPECIFICATION FOR THERMALLY SPRAYED ALUMINIUM (TSA) COATING

#### 1.0 SCOPE

The following sections outlines the requirement of supply, application and testing of thermally sprayed aluminum coatings (TSAC) for corrosion protection of insulated carbon steel piping and equipments with design temperature not exceeding 540 ° C.

#### 2.0 ITEMS TO BE THERMALLY SPRAYED



Steel Structures/equipments to be protected by TSAC shall be as per Tables 15.0 of this standard specification. Structures, components thermally sprayed shall not have any uncoated area or shall not be mechanically connected by flanges etc to any uncoated bare steel work. Such adjacent areas to TSA coated areas, if not coated by TSA shall have suitable paint coating system as per the standard specification.

#### 3.0 TSAC REQUIREMENTS

##### 3.1 Surface Preparation

All the parts to be sprayed shall be degreased according to SSPC-SP 1. The absence of oil and grease after degreasing shall be tested by method given elsewhere in the specification (Refer Sec. 6.7). Thereafter the surface to be abrasive blasted to white metal finish as per NACE 1/SSPC-SP 5 for marine and immersion service. Using SSPC VIS I, it is to be visually assessed that the blast cleaned surface meets requirement of SSPC-SP 5. Thereafter clear cellophane tape test as per ISO 8502-3 shall be used to confirm absence of dust on the blasted surface. Finally blasted surface shall be tested for presence of soluble salts as per method ISO 8502-9. Maximum allowable salt content shall be considered 50mg/m<sup>2</sup>. (5 micrograms/cm<sup>2</sup>). In case salt content exceeds specified limit. The contaminated surface shall be cleaned by method as per Annex C of IS 12944-4 (Water Cleaning). After cleaning the surface shall be retested for salt content after drying. Testing shall be carried out at least on each component, once per 200 m<sup>2</sup> and a min of 3 times per shift during progress of work.

The blasting media shall be either chilled iron or angular steel grit as per SSPC-AB-3 of mesh size G-16 to G-40. Copper, Nickel slag, Garnet or Aluminum Oxide as abrasives will also be suitable having mesh size in the range of G16 to G24 (10-30 mesh), conforming to SSPC-AB-1. Mesh size shall be required as appropriate to the anchor tooth depth profile requirement and blasting equipment used. The blasted surface should be having angular profile depth not less than 65 microns with sharp angular shape but shall not exceed 85 microns. The profile depth shall be measured according to NACE standard RP 0287 (Replica Tape) or ASTM D 4417 method B (Profile depth gauge).

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For manual blasting one profile depth measurement shall be taken every 10-20 m<sup>2</sup> of blasted surface.

Surface preparation shall be completed in one abrasive blast cleaning operation wherever possible.

If rust bloom (visual appearance of rust) appears on the blast cleaned surface before thermal spraying, the affected area shall be reblasted to achieve specified degree of cleanliness after which only thermal spraying shall commence.

Air blasting pressure at nozzle shall be normally maintained at 100 psi. Air pressure and media size should be reduced and adjusted to preclude damage/distortion to thin gauge materials. Blasting time on work piece should be adjusted to only clean the surface and cut required anchor tooth with minimum loss of metal. Blast angle should be as close to perpendicular as possible but in no case greater than  $\pm 30^\circ$  from perpendicular to work surface. Blasting media must be free of debris, excessive fines, and contaminants such as NaCl and sulfur salts (Ref. SEC 6.0 of this Spec). Blast cleaning shall not be performed when the surfaces to be blasted are wet or less than 5°C above dew point temperature or when the relative humidity in the vicinity of the work is greater than 90%.

### 3.1.1 Blasting Equipment

The TSAC applicator shall use mechanical (centrifugal wheel) or pressure pot blast cleaning equipment and procedures. Suction blasting equipment shall not be used. Sec 6.6.2 shall be used to validate clean and dry air.

### 3.1.2 Feed Stock



The feed stock shall be in the form of wire. The feed stock shall be 99.5% aluminum of commercial purity grade, its composition shall be in accordance with requirement of BS 1475 or ASTM B833 or ISO 209-1 type Al (wrought aluminum and aluminum alloys, wire). Wire shall be supplied in protective wrapping indicating batch number and other details.

### 3.1.3 Thickness Requirement

The nominal thickness of finished TSAC shall be 250 microns having minimum value of 225 microns at low thickness areas (valleys) and not more than 275 microns at peak areas.

The finished thickness shall be measured using SSPC-PA 2 type 2 fixed probe gauge (Magnetic Gauge).

### 3.1.4 Coating Bond Strength Requirement

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The TSAC coating shall have a minimum individual tensile-bond strength value of 1000 psi for flame sprayed and 1500 psi for arc sprayed coating with an average of 2000 psi for arc sprayed coatings. Minimum tensile bond strength should be achieved by proper anchor tooth profile of blasted surface, laying down the TSA thickness in multiple passes and carrying out TSA application under controlled environment

### 3.1.5 Porosity

All thermally sprayed metallic coatings will have porosity. For thermally sprayed aluminum coatings porosity shall not exceed 15% of total surface area for flame sprayed coating and 8% for arc spray coating.

## 4.0 THERMAL SPRAY APPLICATION PROCEDURE

Items in the atmospheric zone to be coated by TSA shall be applied by either Flame spray or Arc spray method only. For coating under insulation, application shall be by arc wire method.

### 4.1 Equipment Set Up

**4.1.1** Thermal spray equipment shall be set up calibrated, operated (1) according to manufacturer instructions/technical manuals and also TSAC applicators refinement thereto and (2) as validated by Procedure Qualification (Sec 7.0 of this specification).



#### 4.1.2 Spray Parameters

Spray parameters (see 4.1.3 below) and thickness of each crossing pass shall be set and shall be validated with bend test (See 6.5 of this Spec).

#### 4.1.3 Spray Parameters

Spray Parameters	Method of Application	
	Arc wire Spray	Flame Wire Spray
Arc voltage	27 V	-
Air pressure	80 psi	80 psi
Steel surface cleanliness	NACE-1 white metal	NACE-1 white metal / or Near white metal
Steel surface profile	75 microns (minimum)	75 microns (min.)
Arc current	250-280A	-
Coating thickness	225 microns (nominal)	225 microns (Nominal)
Coating adhesion	>1500 psi (Total coating), see 3.1.4	>1000 psi
Coating porosity	Less than 80%	Less than 15%
Spray distance (spray Gun work piece)	6-8"	5-7"



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Spray Parameters	Method of Application	
Spray Pass width	40 mm	20 mm

The above parameters to be validated with a bend test by the contractor before start of work (for details of bend test see Sec 6.5 of this Spec).

## 4.2 Post Blasting Substrate Condition and Thermal Spraying Period.

**4.2.1** The steel surface temperature shall be at least 5°C above dew point of ambient air temperature.

Steel substrate surface temperature shall be recorded by with a contact pyrometer. Thermal spraying should commence within 15 minutes from the time of completion of blasting

### 4.2.2 Holding Period

Time between the completion of final anchor tooth blasting and completion of thermal spraying of blasted surface should be no more than four hours. If within this period rust bloom appears Sec 4.4. 1 of this specification will apply.

## 4.3 Pre-Heating



For flame spraying, the initial starting area of 1-2 square feet to be preheated to approx.120°C to prevent condensation of moisture in the flame on the substrate. For arc spraying the preheating is not required.

## 4.4 Thermal Spraying

Spraying should commence only after validation of equipment set up by procedure qualification test and spray parameter validation tests described in Sec 7.0 and 6.5 respectively. Thermal spraying must commence within 15 minutes from the time of completion of blast cleaning

The specified coating thickness shall be applied in several crossing passes. The coating bond strength is greater when the spray passes are kept thin. Laying down an excessively thick spray pass increases the internal stresses in TSAC and decreases the bond strength of total TSAC. The suitable thickness for crossing passes shall be determined by procedure qualification test described in Sec 7.0 of this specification.

For manual spraying, spraying to be done in perpendicular crossing passes to minimize thin spots in coating. Approx. 75-100 microns of TSAC shall be laid down in each pass.

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The surface geometry of the item or area to be sprayed should be inspected before application. The spraying pass and sequence shall be planned according to following.

- Maintain Gun as close to perpendicular as possible and within  $\pm 30^\circ$  from perpendicular to the substrate.
- Maintain nominal standoff distance and spray pass width as given below:

Spray method	Standoff (Inches)	Spray pass width
Arc Wire	6-8	1 ½ (40mm)
Flame Wire	5-7	¾ (20mm)

#### 4.4.1 Rust Bloom (Visual appearance of rust or Discoloration)

If Rust bloom appears on the blasted surface before thermal spraying, the affected area shall be reblasted to achieve the specified level of cleanliness.

If Rust bloom in form of discoloration, or any blistering or a degraded coating appears at any time during application of TSAC, then spraying shall be stopped and acceptable sprayed area shall be marked off. The unsatisfactory areas shall be repaired to the required degree of surface cleanliness and profile.

Blast the edges of the TSAC to provide for 2-3" feathered area overlap of the new work into existing TSAC.

Then apply TSAC to the newly prepared surfaces and overlap the existing TSAC to the extent of feathered edge so that overlap is a consistent thickness.

#### 4.4.2 Masking

Masking all those parts and surfaces which are not required to be thermally sprayed as instructed by purchaser should be inspected by applicator to ensure that they are properly marked and covered by purchaser.



Complex geometries (flanges, valve manifolds, intersections) shall be masked by applicator to minimize overspray i.e. TSAC applied outside spray parameters (primarily gun to substrate distance and spray angle).

#### 4.4.3 TSAC Finish

The deposited TSAC shall be uniform without blisters, cracks, loose particles, or exposed steel as examined with 10 X magnification.

### 5.0 SEALER

Sealant shall be applied after satisfactory application of TSAC and completion of all testing and measurements of the finished TSAC as per Sec 6.0 of this specification.

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For shop work Sealer shall be applied immediately after thermal spraying and for field work sealer shall be applied within 8 hours. The sealcoat shall be thin enough to penetrate into the body of TSAC.

The sealant shall be Silicone Alkyd Aluminum paint having OFT not more than 3540 micron. Typically seal coat shall be applied at a spreading rate resulting in theoretical 38 microns OFT. The seal coat shall be applied in accordance with SSPC-PA 1 and the paint manufacturer instruction for sealing.

## 6.0 TESTING AND MEASUREMENT SCHEDULE

### 6.1 Surface Finish

That the blasted cleaned surface meets the required criteria (NACE 1/SSPC-SP 5) shall be visually inspected using SSPC-VIS 1. The clear cellophane-tape test as per ISO 8502-3 shall be used to confirm absence of dust or foreign debris on the cleaned surface. Checks shall be done on each component at least once per 200 m<sup>2</sup> of blasted surface and minimum of 3 checks per shift.

### 6.2 Blast Profile Measurement: (In-Process testing during actual production before application of TSA coating)

The angular profile depth measurement shall be done by profile tape as per method NACE Standard RP 0287 or ASTM 0 4417 method B (Profile depth gauge micrometer). Spot measurement shall be carried out every 15m<sup>2</sup> of blasted surface. At each spot three measurements shall be taken over an area of 10 cm<sup>2</sup> and average of measurements to be recorded and reported.

If profile is <65 microns blasting shall continue till greater than 65 microns depth profile is achieved.



### 6.3 TSAC Thickness (In-Process Testing For finished coating during regular production)

6.3.1 TSAC finished thickness shall be measured using SSPC-PA 2 type 2 fixed probe gauge.

6.3.2 For flat surfaces, measurements shall be taken along a straight measurement line, one measurement line for every 15 m<sup>2</sup> of applied TSAC shall be selected along which 5 measurements to be taken at 25 mm internal and average to be reported.

6.3.3 For curved surface or complex geometry, 5 measurements shall be taken at a spot measuring 10 cm<sup>2</sup> in area. One spot to be taken for every 15 m<sup>2</sup> of applied TSAC area.

6.3.4 The TSAC thickness in surface changes or contour changes, welds and attachments shall be also measured and reported.

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6.3.5 If TSAC is less than specified minimum thickness, apply additional TSAC until specified thickness range is achieved.

6.3.6 All locations and values of TSAC thickness measurements shall be recorded in Job Record (JR).

**6.4** Tensile Bond Testing (In-Process testing for finished coating during regular production)

- Tensile Bond strength of the TSAC finish coat shall be determined according to ASTM D 4541 using a self-aligning adhesion tester.
- One measurement shall be made every 50 m<sup>2</sup>. If tensile bond at any individual spot is less than 1 000 psi for flame sprayed coating and 1500 psi for arc sprayed coating the degraded TSAC shall completely removed and reapplied.
- The tensile bond portable test instrument to be calibrated according to ASTM C 633



**6.5** Bend Tests

Bend test shall be carried out at beginning of each work shift. Bend tests shall also be conducted on sample coupons before start of thermal spraying work to qualify the following as mentioned earlier in this specification.

- To qualify spray parameters and thickness of each crossing pass.

**6.5.1** Test Procedure

- a) Five corrosion control steel coupons each of dimension 50 mm x 150 mm x 1.3 mm thk. to be prepared.
- b) Surface shall be prepared by dry abrasive blast cleaning as per this specification.
- c) TSAC shall be applied as per specified thickness range. TSAC should be sprayed in crossing passes lying down approx. 75-100 microns in each pass.
- d) TSAC applied coupons shall be bent 180 ° around a 13 mm diameter mandrel.
- e) Bend test shall be considered passed if on bend radius there is
  - No cracking or spalling or lifting by a knife blade from the substrate
  - Only minor cracking that cannot be lifted from substrate with a knife blade.
- f) Bend test fails if coating cracks with lifting from substrate.

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## 6.6 Tests for blasting media, blasting air

### 6.6.1 Blasting Media (For every fresh batch of media and one random test during blasting)

Blasting Media shall be visually inspected for absence of contamination and debris using 10 X magnification.

- a. Inspection for the absence of oil contamination shall be conducted using following procedure:
  - Fill a small clean 200 ml bottle half full of abrasive.
  - Fill the bottle with potable water, cap and shake the bottle.
  - Inspect water for oil film/slick. If present, the blasting media is not to be used.
- b. Soluble salt contamination if suspected shall be verified by method ASTM D 4940. If present, media to be replaced.
- c. Clean blasting equipment, especially pot and hoses, and then replace blasting media and retest.

### 6.6.2 Test for Blasting Air (Once Daily before start of blasting and once at random during blasting)

The air for blasting shall be free from moisture and oil. The compressor air shall be checked for oil and water contamination per ASTM D 4285.



## 6.7 Test for presence of oil/grease and contamination

The steel substrate after degreasing as per SSPC-SP I shall be tested as per following procedure to validate absence of oil and grease contamination.

- a) Visual inspection - Continue degreasing until all visible signs of contamination are removed.
- b) Conduct a solvent evaporation test by applying several drops or a small splash of residue-free trichloromethane on the suspect area especially pitting, crevice corrosion areas or depressed areas. An evaporation ring formation is indicative of oil and grease contamination.  
Continue degreasing and inspection till test is passed.

## 7.0 TSAC APPLICATOR QUALIFICATION

Following tests to be carried out as part of procedure qualification test for the applicator.

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- Thickness measurement
- Coating bond strength
- Porosity test
- Bend strength

TSAC applicator's surface finishing and application process and equipment set up, calibration and operation shall be qualified by application of TSA on a reference sample which shall be used as a comparator to evaluate the suitability of application process. Only that applicator will be permitted to carry out the work when test specimens coated by the applicator meets the desired requirements as cited below.

The sample shall be made of a steel plate measuring approx. 18"x 18" x W' thick. If the actual work is less than W' thick then the sample to be made from material of representative thickness.



The surface preparation, TSAC application shall be made with actual field equipments and process/spray parameters and procedures as per the specification. The depth profile of blasted surface, TSAC coating thickness for each cross pass and total thickness range shall be as per specification.

The surface preparation and thermal spraying shall be carried out in representative environmental conditions spraying with makeshift enclosure.

**7.1** After application of coating, thickness and tensile bond measurements shall be made in following manner.

- Divide the sample piece into four quadrants.
- Measure thickness along the diagonal line of each quadrant.
- Four each quadrant five in-line thickness measurements at 1" interval shall be done using SSPC-J>A 2 type 2 fixed probe gauge. Thus a total of four...five in line" thickness measurements to be done for the whole sample.
- One tensile bond measurement using ASTM D 4541 type III or IV portable self aligning test instrument to be done at centre of each quadrant. Total of 4 measurements for the sample.
- One porosity evaluation test by Metallographic examination shall be conducted to demonstrate the achievement of porosity within the limits specified. Sample shall be prepared for Metallographic examination as per ASTM E- 3.
- The procedure shall be considered qualified if thickness and tensile-bond strength and porosity values meet the specification requirement.

**7.2** Bend test: Bend test shall be carried out as detailed at sec. 6.5 of this specification.

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Applicators thermal spray equipment set-up, operation and procedure of application including in-process QC checkpoints adopted during procedure qualification as described above should be always subsequently followed during entire duration of work.

## 8.0 DOCUMENTATION

The following information shall be provided by TSAC applicator before award of work.

- TSAC application process consisting of equipment capabilities and their technical parameters, feed stock material and source of procurement.
- Detailed application procedure and in-process quality control check points for (a) surface preparation (b) thermal spraying (c) seal coats.
- Type and specification of instruments to be deployed for measurement of blast profile depth, TSAC thickness and tensile bond.
- Paint manufacturer data sheet for the selected sealing coat to be applied.

## 9.0 RECORDS

The TSAC applicator shall maintain job record to record production and QC information. All the results of the tests and quality control checks shall be entered in the record for each component/part thermally sprayed. All the result of tests (thickness, tensile bond, bend tests) and other validation tests (e.g. Procedure qualification test, test for surface cleanliness after abrasive blasting, test for cleanliness of abrasives and air) shall also be recorded and duly signed by owner.

All the information mentioned in Sec 8.0 above should also form part of the Job record.



Any modification affected after procedure qualification in the procedure, QC, spray parameter, equipment spec to the original information (submitted before award of the work) must also form part of Job record.

## 10.0 WARRANTY

The TSAC applicator shall warrant the quality of material used by providing the purchaser with a certificate of materials used to include

- a. Spray feed stock: Alloy type/designation, Lot Number, wire diameter, chemical analysis, name of supplier, manufacturer.



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	<b>Subsection – B-2.11</b>				

b. Sealant: Name of manufacturer, application data sheet.

## 11.0 SAFETY



The TSAC applicator shall follow all safety procedures required by the purchaser/owner. Owner shall also give compliance requirement to be followed by applicator. The applicator shall follow all appropriate regulatory requirements.

## 12.0 CODES AND STANDARDS

This specification shall apply in case of conflict between specification and following applicable standards:

AWS C.2.17	Recommended Practice for Electric arc Sprayu
ASTM C 633	Test Method for Adhesive/Cohesive Strength of Flame Sprayed Coatings
ASTM D 4285	Method for indicating Oil or Water in Compressed Air
ASTM D 4417	Test Method for Field Measurement of Surface Profile of Blasted Steel
BS 2569	Specification of Sprayed Metal Coating
NACE Standard RP 0287	Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces Using a Replica Tape
ASTM D 4541	Test method for Pull-Off Strength of Coating Using Portable Adhesion Testers
ANSI/A WS C.18	Guide for the Protection of Steel with Thermal Spray Coatings of Aluminum, Zinc and their Alloys and Composites.
NACE No. 12/AWS C2.23M/SSPC-CS 23.00	Specification for the application of thermal spray coatings (Metallizing) of aluminum, zinc and their alloys and composites for the corrosion protection of steel.
SSPC Publication	The inspection of coatings and linings : A Handbook of Basic practice for Inspectors, Owners, and Specifiers
SSPC-AB 1	Mineral and Slag Abrasives
SSPC-AB 3	Ferrus Metallic Abrasives
SSPC-PA 1	Shop, Field and Maintenance Painting of Steel
SSPC-PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
NACE No. 1/SSPC-SP 5	White Metal Blast Cleaning
NACE No. 2/SSPC-SP 10	Near – White Metal Blast Cleaning
SSPC-VIS 1	Guide and Reference Photographs for Steel Surfaces prepared by Dry Abrasive Blast Cleaning

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0	IFT	27-Oct-2022	ISSUED FOR TENDER	AH	MGB	SDK	
Revision	Status	Date	Description	Prepared	Checked	Approved	MRPL
Client	 <b>MANGALORE REFINERY AND PETROCHEMICAL LIMITED</b>						
Eng. Partner	 <b>NAUVATA ENGINEERING PVT LTD</b>						
Project	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>						
Document Title	<b>JOB SPECIFICATION FOR HOT TAPPING</b>				Location:	<b>MANGALORE</b>	
Scale	Project Code:	Document No.:				Sheet No.:	
A4	JBGD20005					1 OF 8	

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### Abbreviations:

<b>API</b>	<b>American Petroleum Institute</b>
<b>ASME</b>	<b>American Society of Mechanical Engineers</b>
<b>NDT</b>	<b>Non Destructive Testing</b>

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## 1.0 SCOPE

This specification covers the minimum requirements of safety, procedure and equipment for hot-tapping work to be carried out on in-service carbon steel piping systems handling non-sour hydrocarbons in liquid or gaseous phase, and utility service fluids for Piping Modification works of Mangalore Refinery and Petrochemicals Limited, Mangaluru, India.

This specification is not intended to be all inclusive, and the use of guidelines set forth herein does not relieve the Contractor of his responsibility of performing the WORK safely and completing the WORK capable of performing the intended service.

This specification shall be read in conjunction with the conditions of all specifications and documents included in the CONTRACT between MRPL (Hereafter referred to as “Client”) and Contractor.

## 2.0 REFERENCE CODE

**2.1** The hot-tapping works shall be carried out in accordance with the latest edition of API RP-2201 - “Safe Hot Tapping Practices in the Petroleum & Petrochemical Industries” and this specification. All requirements given in API RP-2201 as “recommendatory” shall be considered as mandatory requirements.

**2.2** Reference has also been made in this specification to the latest edition (edition enforce at the time of issue of enquiry) of the following Codes, Standards and Specifications.

ASME B31.3	: ASME Code for Process Piping
ASME Section II Part C	: Specifications for Welding rods , Electrodes and filler metals
ASME Section VIII	: Boiler and Pressure Vessel Code – Rules for Construction of Pressure Vessels
MSS -SP-44	: Steel Pipeline Flanges
MSS-SP-75	: High Strength , Wrought, Butt – Welding Fittings
MSS-SP-97	: Integrally Reinforced Forged Branch outlet Fittings – Socket Welding, Threaded and Butt Welding Ends.
API 510	: Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration
Nauvata spec no..	: Technical Notes for Pipes
Nauvata Spec no..	: Technical notes for butt welded, socket welded and screwed fittings.
Nauvata spec no...	: Welding specification for fabrication of piping
	: Piping Material Specification

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In case of conflict between the requirements of API RP-2201 or other Codes / Standards listed above and this specification, the requirements of this specification shall govern.

### **3.0 MATERIALS**

**3.1** All materials shall meet the requirements of specification for piping materials, included elsewhere in the CONTRACT between Client and the Contractor and shall be suitable for the service and applicable Class Rating for which they are to be used. In case, the Contractor proposes to modify certain requirements of these specifications specifically to suit the hot tapping procedure to be adopted, he may do so, after obtaining the Client's/PMC approval in writing. In any case, prior Client/PMC approval is required for all materials supplied by the Contractor.

### **4.0 PROCEDURE**

**4.1** The Contractor shall obtain necessary permissions from the concerned authorities for all hot-works. For lines requiring statutory approval, Contractor shall obtain approval from the Competent Authority. The Contractor shall ensure that he has requisite permissions from the Competent Authority as well as valid hot work permit before initiating any work whatsoever.

**4.2** All taps shall be made using a full-encirclement fitting having a design suitable for Contractor's proposed procedure.

**4.3** Prior to starting of work, the Contractor shall submit for Client's/PMC's approval, a detailed procedure proposed to be adopted for hot tapping. Such procedure shall contain, but not limited to, the following details:

- Preparation for hot works, viz., selection of location on pipe for hot tap, ultrasonic testing to check the adequacy of available wall thickness and absence of laminations, imperfections and out of roundness to ensure that pipe at the hot tap location is suitable for welding, pre-heating (if required) and cutting operations, etc.
- Method of ensuring and monitoring recommended minimum and maximum velocity of fluid in the piping.
- Connection details.
- Detailed welding procedure
- Procedure for non-destructive testing of weld and hydrostatic test of assembly including test pressures, etc.
- Details of all materials and equipment
- Hot-tapping procedure.
- Safety instructions, and safety measures viz., gas detection tests, tests for presence of toxic environment, etc., and safety measures for installations, equipment, personnel, etc.

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- Approval from Statutory Authority as applicable.

Any additional requirements deemed necessary by Client/PMC or by Authorities having jurisdiction for execution of any or all phases of the work shall be binding on the Contractor.

Contractor shall proceed with construction only after obtaining approval of the procedure from Client/PMC in writing.

- 4.4** Contractor shall carry out all checks as recommended by Hot tapping equipment manufacturer, before hot-tapping work is attempted.
- 4.5** The exact location of the hot tap on the pipe shall be carefully identified and marked in the field and Client's/PMC's approval shall be obtained.
- 4.6** All necessary gas detection tests shall be conducted by the Contractor to ensure safe environment.
- 4.7** Adequate safety arrangements shall be made for the protection of adjacent installations, exposed personnel and equipment.
- 4.8** Contractor shall supply and erect the scaffolding required for the performance of hot tapping. The scaffolding has to be erected in such a way that two separate and independent access will be available for the temporary platforms erected for hot tapping.
- 4.9** No hot-tapping work shall be performed in adverse conditions of weather, such as rain, fog, high dusty winds, etc., which may be detrimental to the quality of the work performed.
- 4.10** Contractor shall provide supports wherever required for existing pipe as per site condition to take care of extra load of hot tapping stub, valve, blinds etc.
- 4.11** Contractor shall prepare safe approaches by filling soil/sand/sand bags/sleepers/wooden blocks etc., for cranes, machineries, personnel to various hot tapping locations as required.

## **5.0 WELDING**

- 5.1** Methods for welding procedure qualification and qualification of welders shall be prepared and submitted by the Contractor for Client's/PMC's review and approval in accordance with PMC Standard Specification. Upon receipt of approval from Client/PMC, the Contractor shall prepare for the tests and conduct them in the presence of Client's representative. Separate qualification tests shall be carried out for each grade of steel and each size of weld. All welding shall be carried out by qualified welders and qualified welding procedures. For welding of piping, falling under the purview of Statutory Regulations, only those welders certified by/acceptable to the concerned regulatory authority shall be employed.
- 5.2** The manual arc process of welding using shallow penetration low hydrogen electrodes shall be used.
- 5.3** Test certificates for each batch of electrodes and other welding materials obtained from the Manufacturer(s) shall be submitted for the approval of Client/PMC. Client/PMC reserves the

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right to reject such material at any time, in the event these materials do not perform to the requirements of this specification.

- 5.4** The weld attaching the fitting to the pipe shall be circumferential to the pipe.
- 5.5** Welds shall be made in the following sequence - longitudinal welds first, then one end circumferential weld, then the other.
- 5.6** The heat input shall be controlled during welding operation to prevent undue overheating of pressurized pipe or vessel.
- 5.7** The surface to be welded shall be smooth, uniform, free of fins, laminations, tears, scales, slag, grease, paint and other deleterious materials, which might adversely affect the welding and its quality.
- 5.8** All weld joints shall be cleaned of slag and other irregularities before the deposition of the next pass. Defective welds shall be completely removed or repaired in accordance with the qualified welding procedure before further welding and when instructed by Client/PMC.
- 5.9** Tack welds, if allowed, shall be executed as per qualified welding procedure. Defective tack welds shall be completely removed prior to final welding.
- 5.10** Prior to commencement of final welding, Contractor shall obtain approval from Client/PMC for proper joint fit-up and alignment.

## **6.0 INSPECTION AND TESTING**

- 6.1** Magnetic particle inspection shall be performed for the first pass and after completion of all welds. In addition, radiographic and/or ultrasonic tests of the welds shall be carried out. For piping requiring statutory approval, testing/examination required as per statute also shall also be complied with.
- 6.2** Before start of the cutting operation, assembly including full bore valve kept in open position shall be hydrostatically tested to a pressure equal to or greater than the operating pressure and not exceeding the internal/external design pressure of the run pipe. The test pressure shall be maintained for a minimum period of one hour. Client's representative shall witness and grant approval on satisfactory completion of the hydrostatic test.
- 6.3** Before using valves in the hot tapping, stub testing is to done at site to check for any leakage as per valve spec.
- 6.4** Before using the valve in the hot tapping, the valve shall be tested for leak/passing in the workshop.
- 6.5** Pneumatic test of reinforcement pads to be done wherever pads are required as per piping specification.
- 6.6** All welds, which, in the opinion of Client, are found to be defective by hydrostatic testing, pneumatic testing or by NDT, shall be repaired or cut and re-welded, as directed by Client, and re-tested. Repair of a repaired weld is not permitted.



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## **7.0 CUTTING OPERATION**

- 7.1** Instructions given by the Manufacturer of the hot-tapping machine shall be strictly followed while installing the machine and during the cutting operation.
- 7.2** Cutting operation shall begin only after all welds have been tested and approved by Client/PMC.
- 7.3** Contractor shall ensure that the full bore ball valve or the sandwich valve is precisely centered on the tee-connection and is cleaned of all dirt, etc.
- 7.4** Boring bar of the hot tap equipment shall be run several times through the valve to ensure that the cutter does not jam or drag.
- 7.5** All bolted joints shall be checked for possible leakage. Packing of hot-tap machine, bleed valve, bolts of cutter, pilot bit and blank catcher shall be checked before starting the cutting operation.
- 7.6** After the cutting operation is complete, the boring bar shall be extracted, the valve closed and the machine shall be depressurized by opening the bleed valve. Machine shall be dismantled after these operations have been completed and when authorized by Client.
- 7.7** A blind flange shall be provided on the valve after removal of hot tap equipment. In the event sandwich valve is utilized, the end shall be made with a Lock-O-Ring flange.

## **8.0 COMPLETION**

- 8.1** The hot-tap work shall be considered complete when it has been certified in writing by Client/PMC that all the works have been satisfactorily completed.
- 8.2** The Contractor shall clear-off the area removing all equipment and left over material, etc. from the job site after completion of the work.

## **9.0 DOCUMENTATION**

- 9.1** Documentation to be submitted by Vendor/Contractor to Client is summarized below.

Number of Copies (Hard copies / soft copies etc.) shall be as indicated in CONTRACT document.

- 9.2** Following documents shall be submitted:

- Hot Tapping Procedure.
- Approved WPS and PQR.
- General Arrangement Drawings (dimensional drawings)
- Sketches of the location (Pipeline KP Point) where hot tapping is performed.
- Details/data sheet of components including tees, valves etc. including size, rating and material details.

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- Welding Records.
- Line pipe material thickness records.
- Weld inspection and NDT records.
- Hydrostatic test Reports.
- Statutory Approvals

## 10.0 Other important notes:

Hot tapplings shall be done in accordance with the Job Specification for Hot Tapping existing refinery.

- a. All branch material required for the execution of hot tapping, Valves, pipes, flanges, gaskets, nuts, blind flanges, etc.as per hook-up drawings shall be supplied by Owner/PMC. Contractor shall supply and erect the scaffolding required for the performance of hot tapping. The scaffolding has to be erected in such a way that two separate and independent access will be available for the temporary platforms erected for hot tapping.
- b. Empty drums if required for draining of the hydrocarbon shall be arranged by the contractor.
- c. Crane required for hot tapping job shall be provided to contractor by PMC / MRPL free of cost.
- d. Hot tapping machine with the operator will be provided to contractor by PMC / MRPL free of cost
- e. Transportation of hot tapping machine from MRPL workshop to the site location will be done by PMC / MRPL.
- f. The Contractor shall supply and fabricate and erect all the structural members and arrangements required for providing support to the existing header on to which the hot tapping is made. The supply, fabrication & erection of the structural members and arrangements required to provide access to platforms where hot tapping personnel & equipment's will be deployed shall also be provided by the contractor.
- g. The scope of work of hot tapping is inclusive of prefabrication of branch fittings, hydrostatic test, pneumatic test, DP/MP tests, arranging of compressor for air test, lug grinding (if required) and installation of valve on the welded stub, fabrication and installation of blind flange on open end of the valve after the completion of hot tapping work and removal of hot tapping machine, transportation of equipment's, materials, etc and all other items require but not limited to mentioned for completion of the work.
- h. The scope of work of hot tapping is inclusive of scaffolding/barricading required if any for carrying out hot tapping at higher elevations.

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	<b>Section – B-B</b>		Document No:		20005-GEN- PI-SPE-
	<b>Subsection – B-2.21</b>		Rev :		0

<b>B-2</b>	<b>SPECIFICATIONS AND DATASHEETS</b>
<b>B-2.21</b>	<b>STANDARD SPECIFICATION FOR FABRICATION AND ERECTION OF PIPING</b>

## MRPL Marketing Infrastructure Project, Mangalore

**PROJECT : Marketing Infrastructure Projects, MRPL**



**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**

**PMC : NAUVATA ENGINEERING PVT. LTD.**

**JOB NO. : JBG20005**



0	12-Oct-22	ISSUED FOR BID
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Rev. No	Date	Purpose	Prepared by	Checked by	Approved by
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## 1 ABBREVIATIONS

AS	Alloy Steel
ASME	American Society of Mechanical Engineers
CI	Cast Iron
CS	Carbon Steel
HMTD	Heat & Mass Transfer Division
IBR	Indian Boiler Regulations
LTCS	Low Temperature Carbon Steel
NACE	National Association of Corrosion Engineers
NB	Nominal Bore
NDT	Non Destructive Testing
PMI	Piping and Instrumentation Diagram Positive Material Identification
SS	Stainless Steel
SMMS	Specialist Material & Maintenance Services

## 2 SCOPE

This specification covers the minimum requirements of fabrication and erection of piping works to be carried out within Refinery at Mangalore Refinery and Petrochemicals Limited, Mangaluru, India.



This specification is not intended to be all inclusive, and the use of guidelines set forth herein does not relieve the Contractor of his responsibility of performing the WORK safely and completing the WORK capable of performing the intended service.

This specification shall be read in conjunction with the conditions of all specifications and documents included in the Bid document between Contractor and PMC / MRPL.



## 3 SCOPE OF WORK OF CONTRACTOR

Generally the scope of work of Contractor shall include the following:

- 3.1. Transportation of required piping materials, pipe support materials and all other necessary piping materials from PMC / MRPL's storage point or Contractor's storage point (in case of Contractor's scope of supply) to work site/shop including raising store requisitions for issue of materials in the prescribed format & maintaining an account of the materials received from PMC / MRPL's stores.
- 3.2. Piping materials include the following but not limited to the same.
  - a. Pipes (All sizes and schedule)
  - b. Flanges (All sizes, types & Pressure ratings).
  - c. Fittings (All sizes, types and schedule)
  - d. Valves (All sizes, types and Ratings)
  - e. Gaskets (All sizes, types & Ratings)
  - f. Bolts, Nuts or M/C Bolts (All types)
  - g. Expansion Joint/Bellows (All types)



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- h. Specialty items like online filters, ejectors, sample coolers, steam traps, strainers, air traps, springs, silencers, snubbers, steam and condensate manifolds, injection nozzles, MOVs, sight glass, spray nozzles, integrated steam traps, hoses, hose couplings, etc.
- i. Online instruments like control valve, orifice flange, rotameter, safety valves, restriction orifice, rupture disc, de-super heaters, corrosion probes, annubar, magnetic flow meter, ultrasonic flow meter, Coriolis mass flow meters, venturi PG/PT/ Flow transmitter, ejectors, static mixers, flame arrestors, thermal flow switches, pre-fabricated hook-ups etc.
- j. Shut down Valves with and without fire box.
- 3.3. Shop & field fabrication and erection of piping in accordance with documents including erection of all piping materials enumerated above.
- 3.4. Fabrication and erection of pipe supports like shoe, saddle, guide, stops, anchors, clips, cradles, hangers, tum-buckles, supporting fixtures, bracket cantilevers, struts, tee-posts including erection of spring supports, sway braces, dummy pipes, corrosion pads/protection shields, low friction pads, clamps, special support, expansion bellows, steam and condensate manifolds supports etc. Corrosion Pads/Protection shields, stiffeners and stiffening rings, if not covered in the specifications/standards, shall be of the same material as of parent pipes.
- 3.5. Site fabrication of piping items  
 Site fabrication of piping items shall include but not be limited to the following
- 3.5.1. Fabrication of piping specials like special radius bends, reducers, mitres etc.
- 3.5.2. Fabrication of plain and threaded nipples from pipes as required during erection.
- 3.5.3. Fabrication of swage nipples as and when required.
- 3.5.4. Fabrication of odd angle elbow like 60°, 30° or any other angle from 90°/45° elbows as and when required.
- 3.5.5. Fabrication of flange, reducing flange, blind flange, spectacle blinds as and when required.
- 3.5.6. Fabrication of stub-in connection with or without reinforcement.
- 3.5.7. Grinding of edges of pipes, fittings, flanges etc. to match mating edges of uneven/different thickness wherever required.
- 3.5.8. Fabrication of circular pipe for steam rings, fire water lines, utility lines.
- 3.5.9. Threading of all small bore piping as per piping material specifications.
- 3.5.10. Drilling on blind flange for inserting I joining small bore lines.
- 3.5.11. Fabrication and welding of reinforcement pads at branch pipe locations wherever required.
- 3.5.12. Equipment nozzle reinforcement with pads, jacket & stiffeners wherever required.
- 3.5.13. Fabrication of injection nozzles as per details provided wherever required.
- 3.5.14. Fabrication of chain operation arrangement for valves, wherever required. All material required for this modification shall be supplied by Contractor.
- 3.5.15. Fabrication and erection in position of funnels required for OWS/ SS/ Condensate blow down system as per direction of Engineer-in-charge.
- 3.5.16. Grinding/ finishing of uneven surfaces/ joints after welding. Internal grinding of welds of orifice flanges to render smooth surface.

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- 3.5.17. Tapping and drilling of holes in flanges, blind flanges, piping connections for jack screw, if required.
- 3.5.18. Providing bird screens at the outlet of lines open to atmosphere.
- 3.6. Modifications like providing additional cleats, extension of stem of valve, locking arrangement of valves etc. as and when required.
- 3.7. Piping isometrics for main process/utility lines shall be provided to the Contractor.  
Preparation of miscellaneous small bore isometrics with bill of materials for process and utility lines (up to 1W' size) like instruments & pump flushing I cooling, sample connection, purging, pump casing vents & drains, pump base plate drains, control valve drains I vent to flare, instrument drains & vents, steam tracing (non-IBR) from steam supply stations up to condensate recovery station, and lines specified as field routed within the Unit battery limit as and when required are in Contractor's scope of work. Approval for these isometrics prepared by the Contractor shall be taken from Engineer-in-charge before erection.  
Small bore piping isometrics given by Owner shall be rechecked by Contractor before erection and installation.
- 3.8. Obtaining approval for drawings prepared by Contractor from statutory authority, if required.
- 3.9. Spun concrete lining of the inside of pipes 3" NB & above including fittings and flanges as required in accordance with specification.
- 3.10. Rubber lining inside pipes, fittings, flanges as and when required, m accordance with specification.
- 3.11. Radiography, stress relieving, dye penetration, magnetic particle test etc. as required m specification.
- 3.12. Performing PMI using alloy analyzers as per 'Standard Specification for Positive Material Identification at Construction Sites, 6-82-0002'.
- 3.13. Casting of concrete pedestals and Fabrication and erection of small structures/ platforms for pipe supports and valve operation I attending some instruments, spectacle blinds etc., providing brackets, modification I extension of platforms, providing additional platforms I ladders for improving I providing accessibility.
- 3.14. Providing insert plates with anchor fasteners in concrete structures I paved floors and repair of platform gratings around pipe openings and providing suitable members for support under the platform grating.
- 3.15. Making material reconciliation statement and return of Owner's supply left over materials to Owner's storage.
- 3.16. Flushing and testing of all p1pmg systems as per standard specification for inspection, flushing and testing of piping systems (Specification No. 6-44-0013). The accessories required for blinding the line like flange, blind flange, gasket (all sizes, type and rating), stud-bolts, flexible hoses etc. are to be arranged by the Contractor. During flushing the discharged water I air shall be drained I routed as directed by the Engineer- in Charge.
- 3.17. Contractor shall prepare welding specifications for all weld joints where dissimilar welding will be performed, and obtain approval from EIL.
- 3.18. Contractor to ensure meeting all requirements for carrying out work in shutdown/running plant.





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- 3.19. Pickling (as and when applicable) as per Job specification(s) for chemical cleaning of CS suction piping of compressors, SS Piping, Weldments etc, as applicable.
- 3.20. Chemical Cleaning/ Hydro jet cleaning as per marked-up P&IDs with supply of chemicals, consumables, DM water, equipments, boilers, coupons, tools & tackles and other testing equipments required for the same.
- 3.21. Fabrication of piping specials like special radius bends, reducers, mitres etc. Fabrication of plain and threaded nipples from pipes as required during erection. Fabrication of swage nipples as and when required.
- 3.22. Fabrication of odd angle elbow like 60°, 30° or any other angle from 90°/45° elbows as and when required.

#### 4 BASIS FOR WORK

- 4.1. The complete piping work shall be carried out in accordance with the following:
  - 4.1.1. "Approved for Construction" drawings and sketches issued by PMC to the Contractor- Plans and/or Isometrics.
  - 4.1.2. "Approved for Construction" drawings and sketches issued by Turn-key bidders to the Contractor- Plans and/or Isometrics.
  - 4.1.3. Approved Process Licensor's standards and specifications.
  - 4.1.4. Drawings, sketches and documents prepared by Contractor duly approved by Engineer-in- Charge (such as isometrics of small bore piping and offsite piping etc.).
  - 4.1.5. EIL specifications/documents as below:
    - a. Process and Instrument Diagram.
    - b. Job Piping Materials Specification (\*\*\*\*-6-44-0005). \*\*\*\*denotes job number.
    - c. Piping support, engineering standards.
    - d. Line list
    - e. Piping support indices (only in offsite), if supports are not shown in plan.
    - f. Job specification of Non-destructive Requirement of Piping (\*\*\*\*-6-44-0016)
    - g. Job Welding Specification Charts for Piping Classes (\*\*\*\*-6-77-0005)
    - h. Job Welding specification for fabrication of piping (\*\*\*\*-6-77-0001).
    - i. Any other EIL or OTHER specifications attached with Piping Material Specification or special condition of contract (such as standard for cement lining of pipe, standard of jacketed piping, standard for steam tracing, Dimensional Tolerances etc.)
    - j. Standard specification for positive material identification (PMI) at construction sites, 6-82-0002
    - k. Standard Spec for application of torque & hydraulic bolt tension for flange joints (6-76-0002) and its addendum, if any.
  - 4.1.6. Following codes, standards and regulations

	ASME B 31.3	Process Piping
	ASME Sec. VIII	Code for unfired pressure vessel.
	IBR Regulations	

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	ASME Sec. IX	Qualification standard for welding and brazing procedures, welders, brazers and welding and brazing operators.
	NACE Std.	Code for Sour Services material requirements MR-0175/MR0103/Job spec(NACE), as applicable

Note: All codes referred shall be latest edition, at the time of award of contract.

#### 4.2. Deviations

Where a deviation from the "Basis of Work" and approved job procedure described above is required or where the basis of work does not cover a particular situation, the matter shall be brought to the notice of Engineer-in-Charge and the work carried out only after obtaining written approval from him in each case.

## 5 FABRICATION

### 5.1. Piping Material



Pipe, pipe fittings, flanges, valves, gaskets, studs bolts etc. used in a given piping system shall be strictly as per the "Piping Material Specification" for the "Pipe Class" specified for that system. To ensure the above requirement, all piping material supplied by the Owner I Contractor shall have proper identification marks as per relevant standards I EIL specifications I Licensors specification. Contractor shall provide identification marks on left over pipe lengths wherever marked up pipe lengths have been fabricated/erected. Material- traceability is to be maintained for A.S., S.S., NACE, LTCS, material for Hydrogen service and other exotic materials by way of transferring heat number, etc. (hard punching) as per approved procedure. This shall be in addition to colour coding for all piping materials to avoid mix-up.

For the purpose of common understanding the construction job procedure, to be submitted by the Contractor, shall include proposal for

- a. Maximizing prefabrication, inspection and testing at fabrication shop with minimum field joints.
- b. Positive material identification, handling, storage & preservation.

### 5.2. Dimensional Tolerances

Dimensional tolerances for piping fabrication shall be as per EIL Standard No. 7-44-0486. The Contractor shall be responsible for working to the dimensions shown on the drawings. However, the Contractor shall bear in mind that there may be variations between the dimensions shown in the drawing and those actually existing at site due to minor variations in the location of equipments, inserts,

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structures etc. To take care of these variations "Field Welds" shall be provided during piping fabrication. An extra pipe length of 100 mm over and above the dimensions indicated in the drawing may be left on one side of the pipe at each of the field welds. During erection, the pipe end with extra length at each field weld, shall be cut to obtain the actual dimension occurring at site. Isometrics, if supplied may have the field welds marked on them. However, it is the responsibility of the Contractor to provide adequate number of field welds. In any case no extra claims will be entertained from the Contractor on this account. Wherever errors I omissions occur in drawings and Bills of Materials it shall be the Contractor's responsibility to notify the Engineer-in-Charge prior to fabrication or erection.

### 5.3. IBR Piping

Contractor shall obtain approval for the piping systems falling under purview of IBR from the statutory Indian Boiler Regulations (IBR) authority of the state where the plant is situated. The Owner shall provide documentation for the IBR System. The Contractor shall carry out the fabrications, erection and testing of this piping as per requirements of Indian Boiler Regulations and to the entire satisfaction of the local Boiler Inspector. The Contractor shall also get the approval of IBR inspector for all fabrication and testing done by him at his own cost. All certificates of approval shall be in proper IBR forms.

IBR Package for residual, field routed and site modified steam lines shall be prepared by the Contractor. IBR approval for the same shall be in Contractor's scope, at his own cost.

### 5.4. Pipe Joints



The piping class of each line specifies the type of pipe joints to be adopted. In general, joining of lines 2" and above in process and utility piping shall be accomplished by butt-welds. Joining of lines 1-1/2" and below shall be by socket welding/butt welding/threaded joints as specified in "Piping Material Specifications". However, in piping 1-1/2" and below where socket welding/ threaded joints are specified butt - welds may be used with the approval of Engineer-in-Charge for pipe to pipe joining in long runs of piping. This is only applicable for non-galvanized piping without lining.

Flange joints shall be used at connections to Vessels, Equipment's, Valves and where required for ease of erection and maintenance as indicated in drawings.

### 5.5. Butt Welded and Socket Welded Piping

End preparation, alignment and fit-up of pipe pieces to be welded, welding, pre-heating, post-heating and heat treatment shall be as described in the Job welding specification (\*\*\*\*-6-77-0005) and NDT specification (\*\*\*\*-6-44-0016).

### 5.6. Screwed Piping

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In general, Galvanized piping shall have threads as per IS:554 or ANSI B2.1 NPT as required to match threads on fittings, valves etc. All other piping shall have threads as per ANSI B2.1, tapered unless specified otherwise.

Threads shall be clean cut, without any burrs or stripping and the ends shall be reamed. Threading of pipes shall be done preferably after bending, forging or heat treating operations. If this is not possible, threads shall be gauge checked and chased after welding heat treatment etc.

During assembly of threaded joints, all threads of pipes and fittings shall be thoroughly cleaned of cuttings, dirt, oil or any other foreign matter. The male threads shall be coated with thread sealant and the joint tightened sufficiently for the threads to seize and give a leakproof joint. Threaded joints to be seal-welded shall be cleaned of all foreign matter, including sealant and made up to full thread engagement before seal welding.

#### 5.7. Flange Connections

All flange facings shall be true and perpendicular to the axis of pipe to which they are attached. Flanged bolt holes shall straddle the normal centerlines unless different orientation is shown in the drawing.

Wherever jack screws are to be provided, drilling and tapping for the jack screws in the flange, shall be done as per EIL Standard before welding it to the pipe.

#### 5.8. Branch Connections

Branch connections shall be as indicated in the piping material specifications. For end preparation, alignment, spacing, fit-up and welding of branch connections refer welding specifications. Templates shall be used wherever required to ensure accurate cutting and proper fit-up.

For all branch connections accomplished either by pipe to pipe connections or by using forged tees the rates quoted for piping shall be inclusive of this work.

Reinforcement pads shall be provided wherever indicated in drawings/ specifications etc.



#### 5.9. Bending

Bending shall be as per ASME B31.3 except that corrugated or creased bends shall not be used.

Cold bends for lines 1-1/2" and below, with a bend radius of 5 times the nominal diameter shall be used as required in place of elbows wherever allowed by piping specifications. Bending of pipes 2" and above may be required in some cases like that for headers around heaters, reactors etc.

The completed bend shall have a smooth surface, free from cracks, buckles, wrinkles, bulges, flat spots and other serious defects. They shall be true to dimensions. The flattening of a bend, as measured by the difference between the maximum and minimum diameters at any cross-section, shall not exceed 8% and 3% of the nominal outside diameter, for internal and external pressure respectively.

#### 5.10. Forging and Forming

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Forging and forming of small bore fittings, like reducing nipples for piping 1-112" and below, shall be as per ASME B 31.3.

**5.11. Mitre Bends and Fabricated Reducers**

The specific application of welded mitre bends and fabricated reducers shall be governed by the Piping Material Specifications. Reducers shall be fabricated as per directions of Engineer-in-Charge. The radiographic requirements shall be as per Material Specifications for process and utility systems and NDT Specification for steam piping under IBR, radiographic requirements of IBR shall be complied with.

**5.12. Cutting and Trimming of Standard Fittings & Pipes**

Components like pipes, elbows, couplings, half-couplings etc. shall be cut I trimmed I edge prepared wherever required to meet fabrication and erection requirements, as per drawings and instructions of Engineer-in-Charge. Nipples as required shall be prepared from straight length piping.

**5.13. Galvanized Piping**

Galvanized carbon steel ptpmg shall be completely cold worked, so as not to damage galvanized surfaces. This piping involves only threaded joints and additional external threading on pipes may be required to be done as per requirement.

**5.14. Jacketed Piping**



The Jacketing shall be done in accordance with EIL Specification or Licensors specification as suggested in material specification or special condition of contract.

Pre-assembly of jacketed elements to the maximum extent possible shall be accomplished at shop by Contractor. Position of jump-over and nozzles on the jacket pipes, fittings etc. shall be marked according to pipe disposition and those shall be prefabricated to avoid damaging of inner pipe and obstruction of jacket space. However, valves, flow glasses, in line instruments or even fittings shall be supplied as jacketed.

**5.15. Shop Fabrication I Prefabrication**

The purpose of shop fabrication or pre-fabrication is to minimize work during erection to the extent possible. Piping spool, after fabrication, shall be stacked with proper identification marks, so as facilitate their withdrawal at any time during erection. During this period all flange (gasket contact faces) and threads shall be adequately fabricated by coating with removable rust preventive. Care shall also be taken to avoid any physical damage to flange faces and threads.

**5.16. Miscellaneous**

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5.16.1. Contractor shall fabricate miscellaneous elements like flash pot, seal pot, sample cooler, supporting elements like tum-buckles, extension of spindles and interlocking arrangement of valves, operating platforms as required by Engineer-in-Charge.

5.16.2. Spun Concrete Lining

The work of inside spun concrete lining of pipes and specials of diameter 3" and above shall be done as per material specifications and special condition contract.

5.16.3. Fabrication of pipes from plate

Pipes shall be fabricated at site as and when required as per the specifications and the actual Piping Material Specification.

## 6 ERECTION

6.1. Cleaning of Piping before Erection

Before erection all pre-fabricated spool pieces, pipes, fittings etc. shall be cleaned inside and outside by suitable means. The cleaning process shall include removal of all foreign matter such as scale, sand, weld spatter chips etc. by wire brushes, cleaning tools etc. and blowing with compressed air/or flushing out with water. Special cleaning requirements for some services, if any, shall be as specified in the piping material specification or isometric or line list. S.S jacketed piping requiring pickling shall be pickled to remove oxidation and discolouring due to welding.

6.2. Piping Routing

No deviations from the piping route indicated in drawings shall be permitted without the consent of Engineer-in-Charge.



Pipe to pipe, pipe to structure equipment distances I clearances as shown in the drawings shall be strictly followed as these clearances may be required for the free expansion of piping I equipment. No deviations from these clearances shall be permissible without the approval of Engineer-in-Charge.

In case of fouling of a line with other piping, structure, equipment etc. the matter shall be brought to the notice of Engineer-in-Charge and corrective action shall be taken as per his instructions.

6.3. Cold Pull

Wherever cold pull is specified, the Contractor shall maintain the necessary gap, as indicated in the drawing. Confirmation in writing shall be obtained by the Contractor from the Engineer-in-Charge, certifying that the gap between the pipes is as indicated in the drawing, before drawing the cold pull. Stress relieving shall be performed before removing the gadgets for cold pulling.



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6.4. Slopes

Slopes specified for various lines in the drawings I P&ID shall be maintained by the Contractor. Corrective action shall be taken by the Contractor in consultation with Engineer- in-Charge wherever the Contractor is not able to maintain the specified slope.

6.5. Expansion Joints I Bellows

Installation of Expansion Joints/Bellows shall be as follows:

6.5.1. All Expansion joints I Bellows shall be installed in accordance with the specification and installation drawings, supplied to the Contractor.

6.5.2.a. Upon receipt, the Contractor shall remove the Expansion Joints/ Bellows from the case(s) and check for any damage occurred during transit.

b. The Contractor shall bring to the notice of the Engineer-in- Charge any damage done to the bellows I corrugations, hinges, tie-rods, flanges/ weld ends etc.

c. Each Expansion Joint I Bellow shall be blown free of dust I foreign matter with compressed air or cleaned with a piece of cloth.

6.5.3.a. For handling and installation of Expansion Joints, great care shall be taken while aligning. An Expansion Joints shall never be slinged from bellows corrugations/ external shrouds, tie I rods, angles.

b. An Expansion Joints I Bellow shall preferably be slinged from the end pipes I flanges or on the middle pipe.

6.5.4.a. All Expansion Joints shall be delivered to the Contractor at "Installation length", maintained by means of shipping rods, angles welded to the flanges or weld ends or by wooden or metallic stops.

b. Expansion Joints stop blocks shall be carefully removed after hydrostatic testing. Angles welded to the flanges or weld ends shall be trimmed by saw as per manufacturer's instructions and the flanges or weld ends shall be ground smooth.



6.5.5.a. The pipe ends in which the Expansion Joint is to be installed shall be perfectly aligned or shall have specified lateral deflection as noted on the relevant drawings.

b. The pipe ends / flanges shall be spaced at a distance specified in the drawings.

6.5.6. The Expansion Joint shall be placed between the mating pipe ends I flanges and shall be tack welded/bolted. The mating pipes shall again be checked for correct alignment.

6.5.7. Butt-welding shall be carried out at each end of the expansion joint. For flanged Expansion Joint, the mating flanges shall be bolted.



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6.5.8. After the Expansion Joint is installed the Contractor shall ensure that the mating pipes and Expansion Joints are in correct alignment and that the pipes are well supported and guided.

6.5.9. The Expansion Joint shall not have any lateral deflection. The Contractor shall maintain parallelism of restraining rings or bellows convolutions.

6.5.10. Precautions

- a. For carrying out welding, earthing lead shall not be attached with the Expansion Joint.
- b. The Expansion bellow shall be protected from arc weld spot and welding spatter.
- c. Hydrostatic Testing of the system having Expansion Joint shall be performed with shipping lugs in position. These lugs shall be removed after testing and certification over.

6.6. Flange Connections

While fitting up mating flanges, care shall be exercised to properly align the pipes and to check the flanges for trueness, so that faces of the flanges can be pulled together, without inducing any stresses in the pipes and the equipment nozzles. Extra care shall be taken for flange connections to pumps, turbines, compressors, cold boxes, air coolers etc. The flange connections to these equipments shall be checked for misalignment, excessive gap etc. after the final alignment of the equipment is over. The joint shall be made up after obtaining approval of Engineer-in-Charge.

Hydraulic bolt tensioning & torque tensioning shall be performed on flange joints as per the requirements specified in "Standard Specification for application of Torque & Hydraulic Bolt Tension for flange joints," 6-76-0002 and its addendum, if any.



Temporary protective covers shall be retained on all flange connections of pumps, turbines, compressors and other similar equipments, until the piping is finally connected, so as to avoid any foreign material from entering these equipments.

The assembly of a flange joint shall be done in such a way that the gasket between these flange faces is uniformly compressed. To achieve this, the bolts shall be tightened in a proper sequence. All bolts shall extend completely through their nuts but not more than 1/4".

Steel to C.I. flange joints, if any, shall be made up with extreme care, tightening the bolts uniformly after bringing flange flush with gaskets with accurate pattern and lateral alignment.

6.7. Vents and Drains

High point vents and low point drains shall be provided as per the instructions of Engineer-in-Charge, even if these are not shown in the drawings. The details of vents and drains shall be as per piping material specifications I job standards.

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6.8. Valves

Valves shall be installed with spindle I actuator orientation I position as shown in the layout drawings. In case of any difficulty in doing this or if the spindle orientation I position is not shown in the drawings, the Engineer-in-Charge shall be consulted and work done as per his instructions. Care shall be exercised to ensure that globe valves, check valves, and other uni- directional valves are installed with the "Flow direction arrow "on the valve body pointing in the correct direction. If the direction of the arrow is not marked on such valves, this shall be done in the presence of Engineer-in-Charge before installation.

Fabrication of stem extensions, locking arrangements and interlocking arrangements of valves (if called for), shall be carried out as per drawings/ instructions of Engineer-in- Charge.

6.9. Instruments

Installation of in-line instruments such as control valve, orifice flange, rotameter, safety valves, restriction orifice, rupture disc, de-super heaters, corrosion probes, annubar, magnetic flow meter, ultrasonic flow meter, Coriolis mass flow meters, venturi PG/PT/ Flow transmitter, ejectors, etc. and Shut Down Valves with fireboxes shall form a part of piping erection work.

Fabrication and erection of piping upto first block valve I nozzle I flange for installation of offline Instruments for measurement of level, pressure, temperature, flow etc. shall also form part of piping construction work. The limits of piping and instrumentation work will be shown in drawings I standards I specifications. Orientations I locations of take-offs for temperature, pressure, flow, level connections etc. shown in drawings shall be maintained.

Flushing and testing of piping systems which include instruments mentioned above and the precautions to be taken are covered in flushing, testing and inspection of piping (EIL Spec. 6-44-0013). Care shall be exercised and adequate precautions taken to avoid damage and entry foreign matter into instruments during transportation, installation, testing etc.



6.10. Line Mounted Equipment's / Items

Installation of line mounted items like filters, strainers, steam traps, mr traps, de-super heaters, ejectors, samples coolers, mixers, flame arrestors, sight glasses etc including their supporting arrangements shall form part of piping erection work.

6.11. Bolts and Nuts

The Contractor shall apply molycoat grease mixed with graphite powder (unless otherwise specified in piping classes) all bolts and nuts during storage, after erection and wherever flange connections are broken and made-up for any purpose whatsoever. The grease and graphite powder shall be supplied by the Contractor within the rates for piping work.

6.12. Pipe Supports

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Pipe supports are designed and located to effectively sustain the weight and thermal effects of the piping system and to prevent its vibrations. Location and design of pipe supports will be shown in drawings for lines 2" NB & above. For lines 1 Y2"NB & below Contractor shall locate and design pipe supports in line with EIL Stds. In case of IBR Lines 1 1/2"NB & below only indicative supporting shall be provided & detailing of such supports is in Contractor's scope. Contractor shall obtain approval of Engineer-in - Charge on drawings prepared by Contractor, before erection. However, any extra supports desired by Engineer- in-Charge shall also be installed.

No pipe shoe I cradle shall be offset unless specifically shown in the drawings.



Hanger rods shall be installed inclined in a direction opposite to the direction in which the pipe move during expansion.

Preset pins of all spring supports shall be removed only after hydrostatic testing and insulation is over. Springs shall be checked for the range of movement and adjusted if necessary to obtain the correct positioning in cold condition. These shall be subsequently adjusted to hot setting in operating condition. The following points shall be checked after installation, with the Engineer-in-Charge and necessary confirmation in writing obtained certifying that:

All restraints have been installed correctly.

Clearances have been maintained as per support drawings. Insulation does not restrict thermal expansion.

All temporary tack welds provided during erection have been fully removed. All welded supports have been fully welded.

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<b>B-2</b>	<b>SPECIFICATIONS AND DATASHEETS</b>
<b>B-2.21</b>	<b>STANDARD SPECIFICATION FOR INSPECTION, FLUSHING AND TESTING OF PIPING SYSTEMS</b>

## MRPL Marketing Infrastructure Project, Mangalore

**PROJECT : Marketing Infrastructure Projects, MRPL**



**OWNER : MANGALORE REFINERY AND PETROCHEMICALS LTD**

**PMC : NAUVATA ENGINEERING PVT. LTD.**

**JOB NO. : JBG20005**



0	12-Oct-22	ISSUED FOR BID

Rev. No	Date	Purpose	Prepared by	Checked by	Approved by

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## 1 ABBREVIATIONS



ASME	American Society of Mechanical Engineers
IBR	Indian Boiler Regulations
PMI	Piping and Instrumentation Diagram Positive Material Identification
PPM	Parts per Million
SS	Stainless Steel

## 2 SCOPE

This specification covers the general requirements for inspection, flushing and testing of piping systems. However, testing of steam lines falling under IBR shall also be governed by Indian Boiler Regulations. Flushing and testing of all piping systems shall be witnessed by the Engineer-In-Charge.

## 3 REFERENCES

ASME B31.3	Process Piping
IBR	Indian Boiler Regulations
6-82-0002	Standard Specification for Positive Material Identification (PMI) at Construction Sites

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#### 4 INSPECTION

During various stages and after completion of fabrication and erection, the piping system shall be inspected by the Engineer-In-Charge to ensure that:

1. Proper piping material has been used.
2. PMI has been performed as per specification.
3. Piping has been erected as per drawings and instructions of Engineer-In-Charge.
4. All supports have been installed correctly.
5. Test preparations mentioned in this specification have been carried out.

#### 5 FLUSHING

Flushing of all lines shall be done before pressure testing. Flushing shall be done by ‘fresh potable water’ or by ‘dry compressed air wherever water flushing is not desirable to clean the pipe of all dirt, debris or loose foreign material.

Required pressure for water flushing shall meet the fire hydrant pressure or utility water pressure. For air flushing, the line/system shall be pressurized by compressed air at the required pressure which shall be 3.5 kg/cm<sup>2</sup>g maximum. The pressure shall then be released by quick opening of a valve, already in line or installed temporarily for this purpose. This procedure shall be repeated as many times as required till the inside of the pipe is fully cleaned.

In line instruments like control valves, orifice plates, rotameters, safety valves and other instruments like thermowells which may interfere with flushing shall not be included in flushing circuit.

The screens/meshes shall be removed from all permanent strainers before flushing. Screens/meshes shall be reinstalled after flushing but before testing.



During flushing temporary strainers shall be retained. These shall be removed, cleaned and reinstalled after flushing, but, before testing.

In case any equipment such as column, vessel, exchanger etc. form part of a piping circuit during flushing, this shall be done with the approval of Engineer-In-Charge. However, equipments thus included in the circuit shall be completely drained and dried with compressed air after flushing is completed.

During flushing discharged water/air shall be drained to the place directed by the Engineer-In-Charge. If necessary, proper temporary drainage shall be provided by the contractor.

Care shall be taken during flushing so as not to damage/spoil work of other agencies. Precautions shall also be taken to prevent entry of water/foreign matter into equipments, electric motors, instruments, electrical installations etc. in the vicinity of lines being flushed.



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	<b>Section – B-B</b>		Document No:		20005-GEN- PI-SPE-
<b>Subsection – B-2.21</b>	Rev :		0		

The contractor shall carry out all the activities required before, during and after the flushing operation, arising because of flushing requirements, such as but not limited to the following:

Dropping of valves, specials, distance pieces, inline instruments and any other piping part before flushing. The flanges to be disengaged for this purpose shall be envisaged by the contractor and approved by the Engineer-In-Charge. These flanges shall be provided with temporary gaskets at the time of flushing.

After flushing is completed and approved, the valve distance pieces, piping specials etc. shall be reinstalled by the contractor with permanent gaskets. However, flanges at equipment nozzles and other places where isolation is required during testing, only temporary gaskets shall be provided.

Records in triplicate shall be prepared and submitted by the contractor for each piping system for the flushing done in the proforma provided/approved by the Engineer-in-Charge.

## 6 PRESSURE TESTING

Pressure testing, in general shall be as per clause 345 of ASME B31.3, unless otherwise specified, herein. Lines carrying highly hazardous/poisonous fluids must have a sensitive leak test. For ffiR lines, 'ffiR Regulations' shall also be followed.



### 1. Extent of Testing

With the exclusion of instrumentation, piping systems fabricated or assembled in the field shall be tested irrespective of whether or not they have been pressure tested prior to site welding or fabrication.

To facilitate the testing of piping systems, vessels and other equipments may be included in the system with the prior approval of Engineer-In-Charge if the test pressure specified is equal to or less than that for the vessels and other equipments.

Pumps, compressors and other rotary equipments shall not be subjected to field test pressure. Lines which are directly open to atmosphere such as vents, drains, safety valves discharge need not be tested, but all joints shall be visually inspected. Wherever necessary, such lines shall be tested by continuous flow of fluid to eliminate the possibility of blockage. However, such lines if provided with block valve shall be pressure tested up to the last block valve.

Seats of all valves shall not be subjected to a pressure in excess of the maximum cold working pressure of the valve. Test pressure applied to valves shall not be greater than the manufacturer's recommendation nor less than that required by the applicable code. Where allowable seat pressure is less than test pressure, test shall be made through an open valve.

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<b>B-2</b>	<b>SPECIFICATIONS AND DATASHEETS</b>
<b>B-2.21</b>	<b>STANDARD SPECIFICATION FOR INSPECTION, FLUSHING AND TESTING OF PIPING SYSTEMS</b>

## MRPL Marketing Infrastructure Project, Mangalore

**PROJECT :** Marketing Infrastructure Projects, MRPL



**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** NAUVATA ENGINEERING PVT. LTD.

**JOB NO. :** JBG20005



0	12-Oct-22	ISSUED FOR BID

Rev. No	Date	Purpose	Prepared by	Checked by	Approved by

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	Part – B	<b>STANDARD SPECIFICATION FOR</b> <b>INSPECTION, FLUSHING AND</b> <b>TESTING OF PIPING SYSTEMS</b>	Tender No : 3200000590	
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## 1 ABBREVIATIONS



ASME	American Society of Mechanical Engineers
IBR	Indian Boiler Regulations
PMI	Piping and Instrumentation Diagram Positive Material Identification
PPM	Parts per Million
SS	Stainless Steel

## 2 SCOPE

This specification covers the general requirements for inspection, flushing and testing of piping systems. However, testing of steam lines falling under IBR shall also be governed by Indian Boiler Regulations. Flushing and testing of all piping systems shall be witnessed by the Engineer-In-Charge.

## 3 REFERENCES

ASME B31.3	Process Piping
IBR	Indian Boiler Regulations
6-82-0002	Standard Specification for Positive Material Identification (PMI) at Construction Sites

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During flushing temporary strainers shall be retained. These shall be removed, cleaned and reinstalled after flushing, but, before testing.

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With the exclusion of instrumentation, piping systems fabricated or assembled in the field shall be tested irrespective of whether or not they have been pressure tested prior to site welding or fabrication.

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Seats of all valves shall not be subjected to a pressure in excess of the maximum cold working pressure of the valve. Test pressure applied to valves shall not be greater than the manufacturer's recommendation nor less than that required by the applicable code. Where allowable seat pressure is less than test pressure, test shall be made through an open valve.

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Client	 <b>MANGALORE REFINERY AND PETROCHEMICAL LIMITED</b>						
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Project	<b>MARKETING INFRASTRUCTURE PROJECTS, REFINERY SITE, MANGALORE</b>						
Document Title	<b>STANDARD SPECIFICATION FOR FABRICATION AND LAYING OF UNDERGROUND PIPING</b>				Location:	<b>MANGALORE</b>	
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### Abbreviations:

<b>ANSI</b>	<b>American National Standards Institute</b>
<b>dia</b>	<b>DIAMETER</b>
<b>IS</b>	<b>Indian Standards</b>
<b>m</b>	<b>METRE</b>
<b>mm</b>	<b>MILLIMETRE</b>
<b>CS</b>	<b>Carbon Steel</b>

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## 1.0 SCOPE

This specification covers the technical requirements for the execution of Piping Fabrication, Assembly and Laying of the underground pipe work defined here under, for water pipe lines.

- i) Fabrication and erection of underground piping systems from piping materials supplied by Owner in accordance with this specification and applicable drawings and standards.
- ii) Testing and flushing.
- iii) Coating of underground piping.
- iv) Fabrication and erection of drain assemblies.

Underground piping systems shall be fabricated, installed, flushed, and tested in accordance with this specification and applicable codes, drawings and standards. Any deviation from the specification and drawings shall be permitted only after obtaining the written approval of the Engineer-in-Charge.

## 2.0 CODES & STANDARDS

ANSI B31.3 Chemical Plant and Petroleum Refinery Piping.

6-65-0006 Standard specification for earth work for U/G piping.

6-44-0012 Standard specification for fabrication and erection of piping.

6-77-0001 Welding specification for the fabrication of piping

6-77-0005 Welding specification charts for piping classes

6-79-0011 Standard specification for corrosion protection tape coating for underground steel piping

NOTE: - Latest Edition of all Codes and Standards shall be followed

## 3.0 FABRICATION

The contractor shall fabricate all the pipe work in conformity with the Standard Specification for Erection of Piping, and requirements of relevant general arrangement drawings. Where specific details of fabrication are not indicated on the drawings or not specified in the specification, fabrication and erection shall be done in accordance with ANSI B 31.3.

The contractor shall be responsible for working to the exact dimensions as shown on the drawings, irrespective of individual tolerances permissible. Where errors and I or omissions occur on the drawings, it shall be the contractor's responsibility to notify the Engineer-in-Charge, prior to fabrication or erection. Dimensional tolerance for fabrication shall be as per standard.

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## **4.0 LAYING OF UNDERGROUND PIPING**

### **4.1 Laying**

4.1.1 The Contractor shall lay the underground piping in accordance with the following clauses and as per the piping arrangement drawings issued during the course of construction. Corrosion protection tape coating of the underground lines shall be in accordance with Standard Specification.

4.1.2 The Contractor shall be responsible for correct layout and gradient of the line. Errors, if any, shall be rectified by the Contractor at his own cost.

### **4.2 Trenching**

4.2.1 The trench shall be cut according to the drawing, true to the line, levelled with the help of sight rails provided at every 30 m, at change of direction I gradient and at any suitable distance, as directed by Engineer-in-Charge.

4.2.2 If the trench is excavated below the required level as indicated in the drawing, the extra depth shall be filled with concrete 1:5:10 or approved equivalent material, as directed by the Engineer-in-Charge, at no extra cost to owner.

4.2.3 The trench shall be excavated so as to provide an average cover of 1000 mm or equal to the diameter of the largest pipe to be laid in the trench, whichever is greater or as shown in drawings. The average cover will be reckoned from top of the pipe of the largest diameter to be laid in the trench, to the finished grade level. The width of the trench shall be sufficient to give free working space on each side of the pipe. The free working space shall conform to specifications. Generally it shall not be less than 150 mm on either side or 1/3 of dia of pipe, whichever is greater.

4.2.4 No excavated material shall be deposited within 1.5 meters from the excavated trench.

4.2.5 In case of road cutting, all materials i.e. metal, bricks etc., shall be taken out carefully and kept separately for reuse. Road work shall be redone up to the original level and profile with the excavated road materials, after laying and testing of the pipe line, within 10 days from the date of starting the work, at the cost of the contractor. The contractor shall provide suitable slings and barricades to prevent accidents. He shall also provide reasonable by-pass at his own cost when a road is cut for laying pipeline.

4.2.6 During excavation, if some obstacle is met with, the same shall be reported to the Engineer-in-Charge and dealt with as instructed by him.

4.2.7 The contractor shall do dewatering, shoring, strutting I timbering if required or do whatever might be required to excavate the trench, install the pipe in it and backfill the trench, in accordance with the specifications, at no extra cost to the Owner. Dewatering shall be done in advance of the laying of the pipe, to allow adequate inspection of padding of the bottom, if required. Dewatering shall be continued throughout during laying of the pipe and backfilling of the trench.

4.2.8 In muddy I slushy ground, the bed shall be provided with a layer of sand or lean concrete as directed by the Engineer-in-Charge.

4.2.9 The trench shall follow the gradient of pipeline as specified in the drawing. The contractor shall keep the trench in good condition, until the pipe is laid and tested. No extra claim shall be

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entertained due to its caving or settling down, either before or after the pipe is laid. All materials to shore the trench, in order to prevent caving, shall be furnished and removed by the Contractor, at no extra cost to the Owner.

4.2.10 In case pipe is lowered in caved trench and back filled before being inspected by the Engineer- in-Charge, the Contractor shall re-excavate the trench for inspection and backfill it at his own cost.

#### 4.3 Lowering & Laying

4.3.1 The pipe shall be lowered by mechanical method when the trench is ready and bottom of the trench is graded as per required pipe laying conditions and specifications.

##### 4.3.2 By Machine

The shop coated pipe already transported to the pipe laying site in convenient length of pipe assembly, near the trench after hydrostatic testing, shall be placed on clean square cut skids suitably spaced, so as to keep the pipe away from touching the ground. The pipe may be lowered down in the trench by the launcher cranes with sufficient care, to protect the coating of the pipeline.

At tie in welds and other site fabrications, the contractor shall clean, prime, coat and wrap manually.

Also short sections of pipelines, which are impracticable to shop-treat, may be hand treated, but only after obtaining prior written approval of the Engineer-in-Charge.

##### 4.3.3 By Hand

4.4 Only in unavoidable circumstances and after obtaining approval of Engineer-in-Charge, the pipe may be lowered with the help of tripods and chain pulley blocks into the trench. However, if in the opinion of the Engineer-in-Charge, the temperature condition does not allow direct lowering, then the pipes shall be set down on clean square cut skids. The skids shall be so spaced as to keep the pipe away from touching the ground.

##### Method & Time of Lowering Pipe

4.4.1 Under favorable temperature conditions and using methods, which will not damage the coating, the pipe may be lowered into the trench.

4.4.2 Pipes previously set on skids, because of unfavorable temperature conditions, shall be lowered into the trench normally in the cool of the morning and only when the temperature of the pipes is below the softening point of the coating materials.

4.4.3 All skid marks and other places of damage shall be thoroughly examined to ensure proper patching where necessary, before the pipe is finally lowered into the trench.

#### 4.5 Handling Coated Pipe

4.5.1 Coated pipe shall not be placed in trench, until cave-in plugs, hard clods, stones, skids and welding rods etc. have been removed from there. Where the trench has a hard or jagged bottom, sufficient fine dirt or sand shall be placed therein, before the pipe is lowered.

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4.5.2 Coated pipe shall not be handled or moved by means of cable or chains or by prying with skids or bars. It shall be tied and lowered by using belts of a standard width and design, for the size of pipe being handled.

4.5.3 Coated pipe shall not be dragged along the ground or otherwise handled in a manner that will be detrimental to the coating.

4.5.4 Despite all precautions taken during handling of coated pipes, if the coating gets damaged, same shall be recoated by Contractor at site, at his own cost, as per directions of Engineer-in-Charge.

#### 4.6 Lining up & welding

4.6.1 The ends of the pipeline shall be kept securely closed, to prevent entry of any foreign material moisture, after lowering into the trench.

4.6.2 Before making joints the pipe shall be laid carefully, so as to be perfectly aligned, in both plan and profile and the end closures provided shall be removed.

4.6.3 Tie-in shall be made in the coolness of the morning or when the ambient temperature is not exceeding 29°C or softening temperature of the coating material, whichever is less. All beveling, aligning and welding shall be in accordance with the welding specification given in the tender.

4.6.4 Free access shall be provided for the welding of the circumferential joints by increasing the width and depth of the trench at these points. There should be no obstruction to the welder from any side, so that good welded joint is obtained.

#### 4.7 Testing & Coating

The completed system shall then be tested as per clause 6.0 and the field welded joints coated as per specification.

#### 4.8 Back Filling

4.8.1 After testing and inspection of the pipeline to the entire satisfaction of the Engineer-in-Charge, the trench shall be back filled with the excavated material. No trench shall be back filled without the approval of the Engineer-in-Charge.

4.8.2 Backfilling with the excavated material shall be done in layers of 200 mm, well watered and rammed to avoid any settling afterwards.

4.8.3 The Contractor shall place soil over the trench to such a height as well as in opinion of the Engineer-in-Charge, to provide adequately for future settlement of the trench backfill.

If due to exigencies of the work, some portion of the pipeline is backfilled without approval of the Engineer-in-Charge, the Engineer-in-Charge shall have the right to order uncovering of the pipe for examination and the cost of such uncovering shall be borne by the Contractor.

4.8.4 The backfill material shall be free from stone pieces.

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4.8.5 When the trench has been dug through roads, all backfill shall be thoroughly compacted. In certain cases, special compaction methods may be required by the Engineer-in-Charge. This shall be done by the contractor at no extra cost to the Owner.

4.8.6 When the trench has been dug through unlined ditches, the backfill shall be thoroughly compacted in 150 mm layers for a distance of 1.5m beyond the outside banks of the ditch on either side. The banks of the ditch shall also be compacted in 150mm layers, at no extra cost to the Owner.

4.8.7 After the roads have been already graded, and if they are trenched or otherwise disturbed by the Contractor during laying of the pipe lines, the contractor shall restore the road to its original level and condition. In the event the Contractor is required to place extra fill, gravel, or other special materials, it shall be done by him without any extra cost to the Owner.

#### 4.9 Cleanup of Surroundings

4.9.1 As soon as the backfill is completed, the contractor shall immediately clean up the adjoining area by removing all surplus and defective material and dispose off all refuse such as spurs, sheet-iron and broken skids and surplus excavated earth etc., at his own cost, to the entire satisfaction of the Engineer-in-Charge.

4.9.2 The earth on both sides of the pipeline trench, which has been disturbed during the construction of the pipe line, shall be smoothed and left in a condition to the entire satisfaction of Engineer-in-Charge.

### 5.0 INSPECTION

#### 5.1 General

5.1.1 Owner's inspector shall have free access to all places where the work is being done or any other thing and place concerned with the work.

5.1.2 Owner is entitled to send his own inspector to field or shops, where prefabrication and erection of pipe lines are being done, with the following functions but not limited to:

- i) To check that the welding performance and welding equipment used on the job are suitable and conform to relevant standards.
- ii) To supervise welding procedure qualification.
- iii) To supervise welder performance qualification.
- iv) To check whether welding is conforming to relevant specification and the practice followed is in accordance with good pipeline construction practice.
- v) To check any other performance to ensure quality of work.

5.1.3 Contractor shall notify sufficiently in advance the commencement of qualification tests, welding work and acceptance tests, to enable the Owner's Inspector to supervise the same.

5.1.4 Contractor shall provide all the facilities to Owner's Inspector, necessary for carrying out his work, at no extra cost to the Owner.

5.1.5 Approval from the Owner's Inspector shall not relieve the contractor partially or fully of his responsibilities and guarantees under this contract

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## 6.0 TESTING

### 6.1 General

6.1.1 The field test pressure shall not be less than the greatest of the following:

- a) 1.5 times the maximum sustained operating pressure.
- b) 1.5 times the maximum pipeline static pressure, and
- c) Sum of the maximum sustained operating pressure or the maximum pipeline static pressure and the maximum calculated surge pressure.

The field test pressure shall, wherever possible be not less than two thirds of the work test pressure, and shall be applied and maintained for at least four hours.

Where the field test pressure is less than two-thirds the works test pressure, the period of test shall be increased to at least 24 hours. The test pressure shall be gradually raised at the rate of nearly 1.0 kg/cm<sup>2</sup>1 minute.

6.1.2 The testing shall be carried out in convenient section as approved by the Engineer-in-charge. The joints of the pipe, connecting the testing sections, shall be 100% radiographed.

If some defect is noticed during the hydrostatic testing, the same shall be brought to the notice of Engineer-in-Charge. Joints, if leaking, shall be rectified as per the welding specifications and instructions of Engineer-in-Charge and tested to his satisfaction, at no extra cost to the Owner.

6.1.3 The Engineer-in-Charge shall be notified in advance by contractor of all testing. The hydrostatic testing I flushing of all the piping shall be carried out by the Contractor, at his own cost.

6.1.4 Contractor shall make his own arrangements for flushing, at suitable points, as per the instructions of the Engineer-in-Charge. Any extra work I modification on this account shall be done by the Contractor at his own cost.

### 6.2 Test Medium

Construction water shall generally be used as the testing medium, for the hydrostatic testing of piping system.

### 6.3 Cleaning

All systems shall be cleaned and flushed free of all dirt, debris or loose foreign material, after testing.

### 6.4 Temporary Blinds

Open ends of piping systems, such as at pumps or wherever equipment has been removed or disconnected prior to hydrostatic testing, or at termination point of piping branch connections, shall be blinded off by temporary blind flange, made out of 10 mm thick CS plate.

### 6.5 Venting



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All piping systems and equipment shall be properly vented, to remove air from system, during filling.

#### 6.6 Pressurizing

6.6.1 Pressure shall be applied by means of a suitable test pump, which shall not be connected to the system until ready to test. A pressure gauge shall be provided at the pump discharge for guidance in bringing the system to required pressure. The pump shall be attended to constantly during the test, by an authorised operator. The pump shall be disconnected, after the pressure test is completed.

6.6.2 The test pressure is to be maintained for sufficient time, to permit complete inspection of the system under test, but in no case shall the time be less than ten minutes. Test shall be considered complete only when approval is given by the Engineer-in-Charge.

#### 6.7 Test Gauges

Contractor's own test gauge shall be installed as close as possible to the lowest point in the system being tested. Prior to installation, the test gauge shall be checked against a standard gauge or calibrated with the aid of a dead weight tester. Calibration of test gauges shall be the responsibility of the contractor.

#### 6.8 Draining

6.8.1 All lines and equipments shall be completely drained after the hydrostatic test of the system has been completed. High point vents shall be open to prevent excessive vacuum and permit complete draining.

6.8.2 If it becomes necessary to leave a system filled with the testing medium for any abnormal length of time, suitable arrangement such as venting shall be made to provide for possible liquid expansion with change in ambient temperatures.

### 7.0 RECORDS

Records in triplicate shall be made for each piping system as follows:

7.1 In case of underground piping, layouts giving actual elevations of pipeline as laid.

7.2 Test certificates containing date of test, identification of the piping system, test fluid used, test pressure and approval of Owner's Inspector.

7.3 Certificates for flushing containing flushing medium used, identification of the piping system, date of flushing & approval by Owner's Inspector.

### 8.0 PAYMENT

8.1 Payment for piping shall be based on linear measurements, calculated on the basis of the execution drawings. The length shall be measured along the center lines of pipes, center lines of bends and elbows, tees, reducers and flanged joints. All types of valves shall be excluded

**Title** : STANDARD SPECIFICATION FOR FABRICATION AND LAYING OF UNDERGROUND PIPING

**Project No.** : JBGD20005

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from this measurement. Branch connections shall be measured from the outer surface of the header.

The payment shall be made on per metre basis of piping work laid, measured to the nearest centimeter. The unit rates for the underground piping shall be inclusive of earthwork in excavation, backfilling, compaction, disposal of surplus earth and coating and wrapping including supply of materials.

All piping attachments, such as couplings, nipples, thermowells etc., shall be installed by the Contractor as part of piping work and no separate payment shall be made for such work. However, extension on such attachments such as vents and drains will be measured and paid as applicable for the respective size and category of piping I valves.

Fabrication of mitre bends, concentric and eccentric reducers fabricated from pipes supplied by owner & fabrication of flanges from plates supplied by owner, will be paid at respective unit rates. However, erection of these items will be along with piping of the respective size and no separate payment will be made for erection.

The reducers will be measured and paid along with the piping of large diameter.

No separate payment will be made for making pipe to pipe branch connection and crosses, with or without reinforcing pads. The unit rates for piping are deemed to include all such work. Fabrication, installation and removal of temporary spool pieces etc. to aid contractor's work such as fabrication, erection, flushing and testing etc. will neither be measured nor paid separately. The same is deemed to be included in the unit rates for piping. Payment for carrying out radiographic examination shall be based on linear length of the welded joint radiographed. Repeat radiography I additional radiography required due to contractor's faults I poor performance of his welders and defective films etc., shall be done at contractor's own cost.

8.2 The payment clause(s) as described in the clause no. 8.1 shall not be referred I applicable for LSTK Job.

INSTRUMENT ABBREVIATIONS

ARV	AUTO RECIRCULATION VALVE	ESD	EMERGENCY SHUT DOWN
AF	FLAME ARRESTOR	FC	CONTROL VALVE FAIL CLOSED
DBBV	DOUBLE BLOCK BLEED VALVE	HH	HIGH HIGH ALARM
DCV	DIGITAL CONTROL VALVE	HY	HYDRANT
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	MCC	MOTOR CONTROL CENTER
DPI	DIFFERENTIAL PRESSURE INDICATOR	MW	MAN WAY
FM	FLOW METER	MF	MAINTENANCE FLANGE
FT	FLOW TRANSMITTER	LCP	LOCAL CONTROL PANEL
LA	LEVEL ALARM	LEL	LOWER EXPLOSIVE LIMIT
LAH	LEVEL ALARM HIGH	OD	OUTSIDE DIAMETER
LAHH	LEVEL ALARM HIGH HIGH	NB	NOMINAL BORE
LAL	LEVEL ALARM LOW	FCU	FIELD COMMUNICATION UNIT
LALL	LEVEL ALARM LOW LOW	FCP	FILTER CONTROL PANEL
LG	LEVEL GAUGE	NC	NORMALLY CLOSED
LI	LEVEL INDICATOR	NO	NORMALLY OPEN
LI	LEVEL INDICATOR TRANSMITTER	SDP	SHUT DOWN PANEL
LS	LEVEL SWITCH	STR	STRAINER (PERMANENT)
LT	LEVEL TRANSMITTER	TFMS	TANK FARM MANAGEMENT SYSTEM
MOV	MOTOR OPERATED VALVE	UG	UNDER GROUND
PB	PUSH BUTTON	TYP	TYPICAL
PG	PRESSURE GAUGE	HWP	HARD WIRED PANEL
PI	PRESSURE INDICATOR	F & G	FIRE & GAS PANEL
PIC	PRESSURE INDICATOR CONTROLLER	TS	TERMINAL SERVER
PS	PRESSURE SWITCH	PRCS	LOADING RACK COMPUTER SYSTEM
PSH	PRESSURE SWITCH HIGH	PLT	PIPE LINE TRANSFER
PSL	PRESSURE SWITCH LOW		
PSV	PRESSURE SAFETY VALVE		
PT	PRESSURE TRANSMITTER		
PDM	POSITIVE DISPLACEMENT FLOW METER		
RO	RISIRCTION ORIFICE		
SG	SIGHT GLASS		
TE	TEMPERATURE ELEMENT		
TG	TEMPERATURE GAUGE		
TFM	TURBINE FLOW METER		
TI	TEMPERATURE INDICATOR		
TT	TEMPERATURE TRANSMITTER		
TW	THERMOWELL		
XV	ON/OFF VALVE		
BCU	BATCH CONTROL UNIT / BATCH CONTROLLER		
DM	DENSITY METER		
DI	DENSITY INDICATOR		
TL	TANK LORRY		
TF	TANK FARM		
BAE	BULK AIR ELIMINATOR		
TLA	TOP LOADING ARM		
BLA	BOTTOM LOADING ARM		
LIA	LEVEL INDICATOR ALARM		
DPG	DIFF.PRESSURE GAUGE		
D	DAMPENER		
XLC	LIMIT SWITCH CLOSE F/B		
XLO	LIMIT SWITCH OPEN F/B		
SP	SET POINT		
PVRV	PRESSURE VACUUM RELIEF VALVE		
TSV	THERMAL SAFETY VALVE		
NRV	NON RETURN VALVE		
HDR	HEADER		
MFD	MANIFOLD		
MFM	MASS FLOW METER		
ETP	EFFLUENT TREATMENT PLANT		
SAE	STRAINER CUM AIR ELIMINATOR		
CRVT	CONICAL ROOF VERTICAL TANK		
FRVT	FLOATING ROOF VERTICAL TANK		
VRU	VAPOUR RECOVERY UNIT		
YL	RUN FEEDBACK		
HS	HAND SWITCH		
LR	LOCAL / REMOTE		
YI	DRIVE READY		
XA	DRIVE FAULT		
HT	HOOTER		
BC	BEACON		
RS	RUN STATUS		
GZD	HC GAS DETECTOR		
GH	GAUGE HATCH		
WCFM	WATER CUM FOAM MONITOR		
MEFG	MEDIUM EXPANSION FOAM GENERATOR		
SGB	SILICA GET. BREATHER		
JRCP	JET RATIO CONTROLLER & PROPORTIONAL		
HVLRM	HIGH VOLUME LONG RANGE MONITOR		
ROSOV	REMOTE OPERATION SHUT OF VALVE		
TOBV/TOBF	TRIPLE OFFSET BUTTERFLY VALVE		
SP	SAMPLE VALVE		
DT	DENSITY TRANSMITTER		
ZLS	LIMIT SWITCH CLOSE F/B		
ZLH	LIMIT SWITCH OPEN F/B		

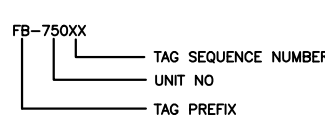
EQUIPMENT CODE

FB	STORAGE TANK
GA	PUMP
AD	SUMPS & PITS
GB	COMPRESSORS
FA	PRESSURE VESSEL
FD	PRESSURE FILTER
PL	PIG LAUNCHER
PR	PIG RECEIVER

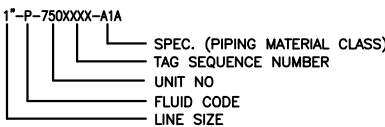
FLUID CODE

MS	MOTOR SPIRIT
HSD	HIGH SPEED DIESEL
ATF	AVIATION TURBINE FUEL
MSAD	MS ADDITIVE
HSDAD	HSD ADDITIVE
ETH	ETHANOL
OWS	OIL WATER SEWER
BIOD	BIO DIESEL
INT	INTERFACE
IA	INSTRUMENT AIR
PA	PLANT AIR
UW	UTILITY WATER
DW	DRINKING WATER/POTABLE WATER
SLP	SLOP
ATFAD	ATF ADDITIVE
RW	RAW WATER
WW	WASTE WATER
FM	FOAM SOLUTION
FW	FIRE WATER
PCA	PIPELINE COMPATIBLE ATF
PCK	PIPELINE COMPATIBLE KEROSENE
SKO	SUPER KEROSENE OIL

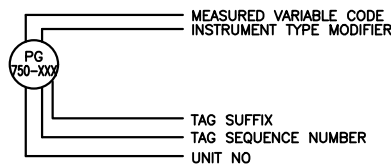
EQUIPMENT IDENTIFICATION



LINE IDENTIFICATION



INSTRUMENT IDENTIFICATION



LINE SYMBOL

—————	PROCESS/UTILITY LINE
-----	ELECTRICAL LINE
---/---/---	INSTRUMENT AIR LINE
---x---x---	CAPILLARY LINE
===== =====	ELECT. TRACED LINE
-----	VENDOR LIMIT LINE
-----	CENTER LINE
—o—o—o—	DCS SIGNAL LINE
— — — — —	HYDRAULIC LINE
—o—o—o—	MECHANICAL LINK
~~~~~	MICROWAVE SIGNAL
---/---/---	PNEUMATIC SIGNAL

INSTRUMENT SYMBOL

○	FIELD INSTRUMENTS INDIVIDUALLY SPECIFIED
⊙	GAUGE HATCH
⊙	DENSITY TRANSMITTER
⊙	MULTI-SPOT TEMPERATURE CUM WATER BOTTOM SENSOR
⊙	EMERGENCY SHUT-OFF VALVE
⊙	AUTOMATIC OVERFILL PROTECTION SYSTEM
⊙	LOCAL PANEL INSTRUMENT
⊙	CENTRAL PANEL INSTRUMENT
⊙	REAR CENTRAL PANEL INSTRUMENT
⊙	REAR LOCAL PANEL INSTRUMENT
⊙	DCS (NORMALLY ACCESSIBLE TO OPERATOR)
⊙	DCS (NOT NORMALLY ACCESSIBLE TO OPERATOR)
⊙	INTERLOCK COMPUTER FUNCTION CENTRAL PANEL
⊙	PLC
⊙	COMPUTER FUNCTION LOCAL PANEL
⊙	FUNCTION BLOCK / INSTRUMENT BOX
⊙	VENTURI TUBE NOZZLE
⊙	ORIFICE PALTE
⊙	TURBINE METER
⊙	MASS FLOW METER
⊙	PUSH BUTTON
⊙	SHUT DOWN
LO/LC	NORMALLY LOCK OPEN INTERCHANGABLE TO LC
LC/LO	NORMALLY LOCK CLOSED INTERCHANGABLE TO LO
⊙	SELECTOR SWITCH

PIPING MATERIAL SPECIFICATION

SPEC	RATING	MOQ
A1A	150#	CS
B1A	300#	CS
A1M	150#	SS316

PIPING SYMBOL

⊗	GATE VALVE	⊗	Y-TYPE STRAINER
⊗	GLOBE VALVE	⊗	BASKET STRAINER
⊗	CHECK VALVE	⊗	HOSE CONNECTION
⊗	BUTTERFLY VALVE	⊗	BLIND FLANGE
⊗	PLUG VALVE	⊗	REDUCER/EXPANDER
⊗	BALL VALVE	⊗	BURIED
⊗	NEEDLE VALVE	⊗	DRAIN PLUG
⊗	SOLENOID VALVE	⊗	DRAIN FLANGED
⊗	MOTORISED DOUBLE BLOCK BLEED VALVE	⊗	
⊗	CONTROL VALVE	⊗	
⊗	DRAIN	⊗	
⊗	VENT	⊗	
⊗	MOTOR OPERATED VALVE	⊗	CENTRIFUGAL PUMP
⊗	SELF ACTUATED PRV DOWN STREAM /BYPASS LINE AUTO RECIRCULATOR VALVE	⊗	PNEUMATIC VALVE
⊗	SAMPLE POINT	⊗	MICRON FILTER(PRE FILTER)
⊗	SIGHT GLASS	⊗	RESTRICTON ORIFICE
⊗	SPECTACLE BLIND OPEN	⊗	FLOATING SUCTION
⊗	SPECTACLE BLIND CLOSE	⊗	TFMS
⊗	SPACER	⊗	SCREW PUMP
⊗	FLEXIBLE HOSE	⊗	DH-DOUBLE HYDRANT
⊗	MOTORISED GATE VALVE	⊗	WCFM-WATER CUM FOAM MONITOR
⊗	MOTORISED PLUG VALVE	⊗	MEFG-MEDIUM EXPANSION FOAM GENERATOR
⊗	TEMPERATURE SAFETY VALVE	⊗	HVLRM-HIGH VOLUME LONG RANGE MONITOR
⊗	AUTORECIRCULATION VALVE	⊗	
⊗	BULK AIR ELIMINATOR	⊗	
⊗	DRAIN WITH BLIND FLANGE	⊗	
⊗	LOADING ARM	⊗	
⊗	FLAME ARRESTOR	⊗	
⊗	BLIND FLANGE	⊗	
⊗	SPRING LOADED VALVE	⊗	
⊗	FOOT VALVE	⊗	
⊗	OPEN DRAIN FUNNEL	⊗	
⊗	METERING PUMP (MOTOR DRIVEN)		

SLNO	REV.	TITLE
REFERENCE DRAWINGS		
0	01-JUL-22	ISSUED FOR DESIGN
B	17-JUN-22	ISSUED FOR APPROVAL
A	12-APR-22	ISSUED FOR REVIEW
REV.	DATE	DESCRIPTION
		DRWN CHKD APPRD MRPL
		NAU

CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES**

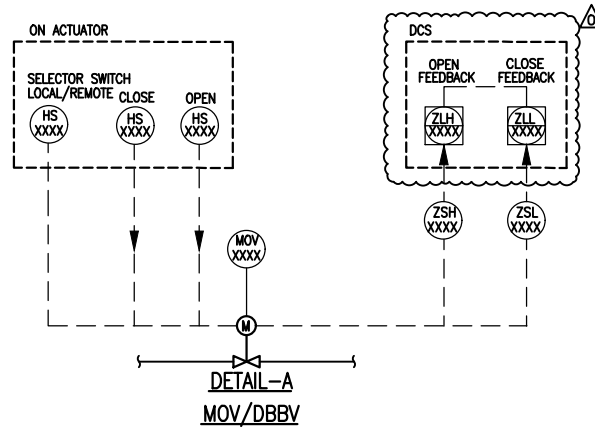
PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET FOR PFD AND P&ID**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1060	1 OF 2	0	1:1

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DRAWING NO.: 750-20005-P-PID-1060




**NOTES**


1. TAG NUMBER WILL BE SAME AS CORRESPONDING MOV TAG NUMBER.
2. MOV SHOULD HAVE OPEN/CLOSE FACILITY AT FIELD FROM OUTSIDE DYKE AND FROM CONTROL ROOM.
3. ALL MOV'S AND ACCESSORIES (INCLUDING ACTUATOR) SHALL BE FIRE SAFE.
4. HAND WHEEL SHALL BE PROVIDED FOR ALL MOV'S.

SLNO	REV.	TITLE
REFERENCE DRAWINGS		

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
0	01-JUL-22	ISSUED FOR DESIGN	SPS	PM	NSN	
B	17-JUN-22	ISSUED FOR APPROVAL	SPS	PM	NSN	
A	12-APR-22	ISSUED FOR REVIEW	SPS	PM	NSN	

CLIENT:  
 **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT:  
 **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET FOR PFD AND P&ID**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1060	2 OF 2	0	1:1

**FD-75001 (NEW)**  
 CARTRIDGE FILTER  
 Fluid : PCA  
 Particle size : UPTO 2 MICRONS  
 Design Pressure : 10 kg/cm<sup>2</sup>  
 Design Temperature : 65 °C  
 Flow rate : 440 M<sup>3</sup>/hr

**FB-7037B (MODIFIED)**  
 PCA STORAGE TANK  
 Fluid : PCA  
 Size : 22m (D) x 15m (H)  
 Design Temperature : 65 °C  
 Type : (INTERNAL FLOATING ROOFTANK)  
 Pump In-Rate : 400 M<sup>3</sup>/hr  
 : 2900 M<sup>3</sup>/hPump Out-Rate

**EC-7037C/D (EXISTING)**  
 JET MIXER  
 Flow : 300 M<sup>3</sup>/hr  
 Design Pressure : 9.0 kg/cm<sup>2</sup>  
 Design Temperature : 65 °C

**GA-7009B (EXISTING)**  
 PCA CIRCULATION PUMP  
 Fluid : PCA  
 Capacity : 440 M<sup>3</sup>/hr  
 Head : 66 MWC  
 Type : Horizontal Centrifugal Pump

**GA-75001 (NEW)**  
 PCA CIRCULATION PUMP  
 Fluid : PCA  
 Capacity : 440 M<sup>3</sup>/hr  
 Head : 66 MWC  
 Type : Horizontal Centrifugal Pump

**FA-75001 (NEW)**  
 DOSING TANK  
 Fluid : STADIS-450  
 Design Pressure : ATM + FULL OF LIQUID  
 Design Temperature : 65 °C

**FA-75002 (NEW)**  
 LUBRICITY DOSING TANK  
 Fluid : NALCO LUBRICITY ADDITIVE  
 Design Pressure : ATM + FULL OF LIQUID  
 Design Temperature : 65 °C

**GA-75003 (NEW)**  
 LUBRICITY DOSING PUMP  
 Capacity : 0.1-1 M<sup>3</sup>/hr  
 Head : 2.0 kg/cm<sup>2</sup>  
 Type : metering pump

**NOTES**

- EXISTING VALVES SHALL BE REMOVED AND BOTH SIDE LINES SHALL BE BLUNDED.
- EXISTING LINE SHALL BE DISCONNECTED BY CUTTING AND NEW PIPE CONNECTION WILL BE PROVIDED BY WELDING.
- EXISTING T-TAPPING IN THE LINE SHALL BE DISCONNECTED AND NEW ELBOW CONNECTION SHALL BE PROVIDED.
- EXISTING 36" TAPPING FROM TANK FB-7003G SHALL BE DISCONNECTED AND NEW FLANGE AND BLIND FLANGE SHALL BE PROVIDED.
- EXISTING 36" TEE SHALL BE REMOVED AND LINE SHALL BE MADE STRAIGHT.
- EXISTING XYLOL TANK FB-7037B EXTERNAL FLOATING TYPE ROOF SHALL BE CONVERTED TO INTERNAL FLOATING ROOF AND NEW FIXED CONE ROOF SHALL BE PROVIDED.(DUAL ROOF TANK). ALL EXISTING INSTRUMENTS SHALL BE RE-USED.
- EXISTING 12" VALVE SHALL BE REMOVED AND NEW BLIND FLANGE SHALL BE PROVIDED ON BOTH SIDE.
- EXISTING 16" VALVE SHALL BE REMOVED AND NEW 2 BLIND FLANGES SHALL BE PROVIDED.
- SAMPLING CONNECTION SHALL BE FROM THE TOP AND BOTTOM OF PIPE LINE AND SHALL BE HOOKED TO AS PER EXISTING STANDARD OWS.
- DELETED.
- NEW SS DIP HATCH SHALL BE PROVIDED.
- PT 301 IS FOR DENSITY MEASUREMENT ALSO.
- ALL EQUIPMENT, LINES, INSTRUMENTS, MOVES AND DBBY TAG NUMBERS START WITH 750 ARE NEW ITEMS.
- ALL NEW INSTRUMENTS TAG NUMBERS SHALL BE PREFIXED WITH UNIT No. 750.
- LI-705304 AND PT-705301 SHALL BE AT SAME ELEVATION.
- MODIFIED TANK SHALL BE PROVIDED WITH FOAM SYSTEM (SINKING ROOF).
- ALL LINES/POCKETS SHALL BE PROVIDED WITH LOW POINT DRAINS.
- RO-750101 SHALL BE PROVIDED TO ENSURE PCA CIRCULATION RATE IS NOT MORE THAN 300m<sup>3</sup>/hr FOR TANK FB-7004C.
- EXISTING 12" VALVE AND THE SPOOL BETWEEN 12" VALVE AND CHECK VALVE SHALL BE REMOVED AND ONE BLIND FLANGE SHALL BE PROVIDED AT THE DOWNSTREAM OF THE 12" VALVE REMOVED.
- EXISTING 12" VALVE (REMOVED) SHALL BE RE-USED.
- HOLD FOR VENDER DATA.
- INSULATING GASKETS TO BE CONSIDERED FOR DISSIMILAR METAL FLANGES.
- MAGNETIC TYPE LEVEL GAUGE.
- FOR MOTOR SIGNAL CONNECTIONS REFER TO LEGEND P&ID 750-20005-P-PID-1060 SHT 2 of 2.

**LEGENDS.**

- HOT TAPPING
- COLD TAPPING/JOINT
- EXISTING
- NEW/PROPOSED
- DEMOLITION
- HOT JOINT

SLNO	REV.	TITLE
<b>REFERENCE DRAWINGS</b>		

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
0	01-JUL-22	ISSUED FOR DESIGN	SPS	SK/PM	NSN	
B	17-JUN-22	ISSUED FOR APPROVAL	SPS	SK/PM	NSN	
A	25-MAR-22	ISSUED FOR REVIEW	SPS	SK/PM	NSN	

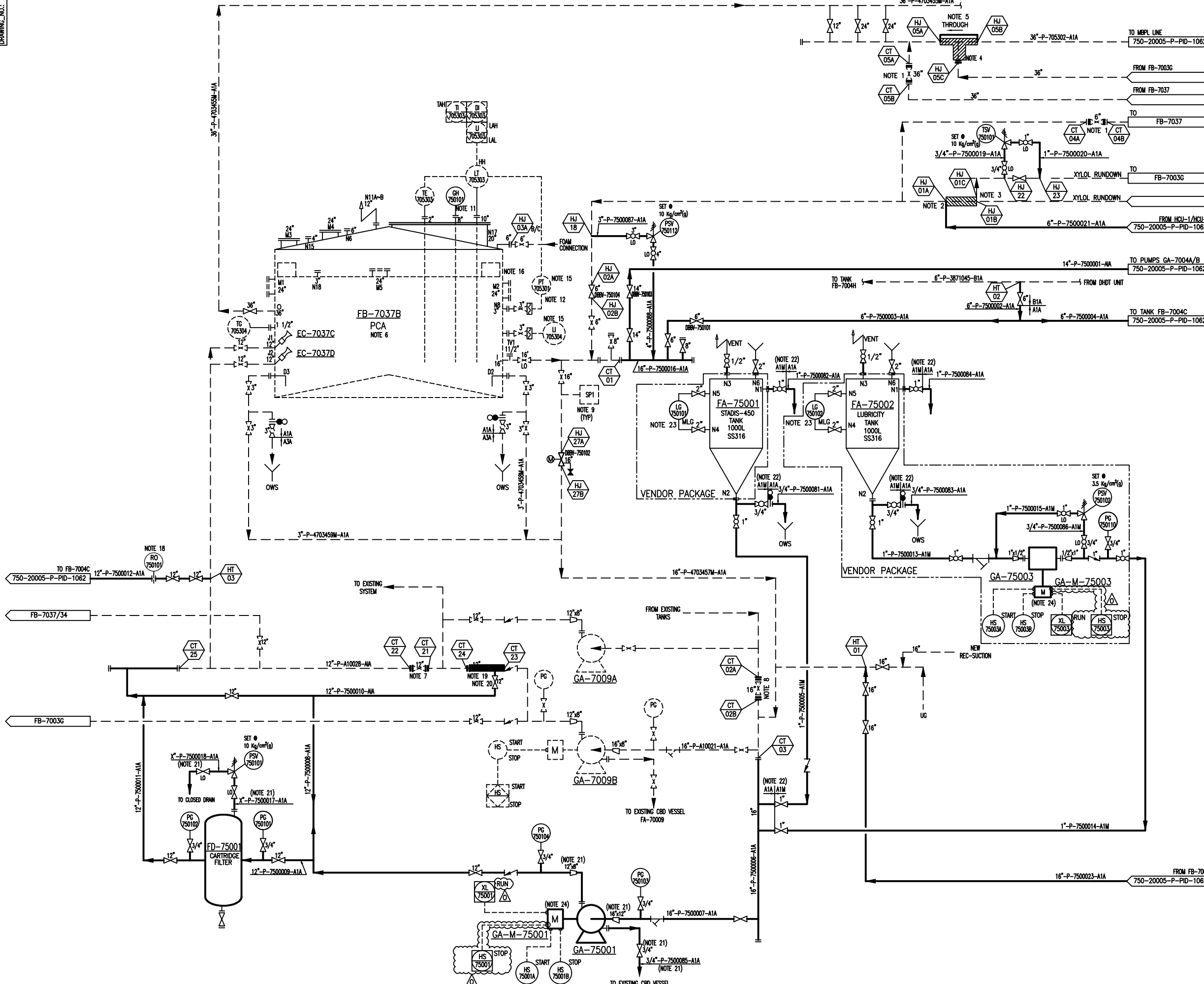
CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES**

PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7037B AND PUMPS GA-7009B/GA-75001**

TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1061	1 OF 1	0	1:1

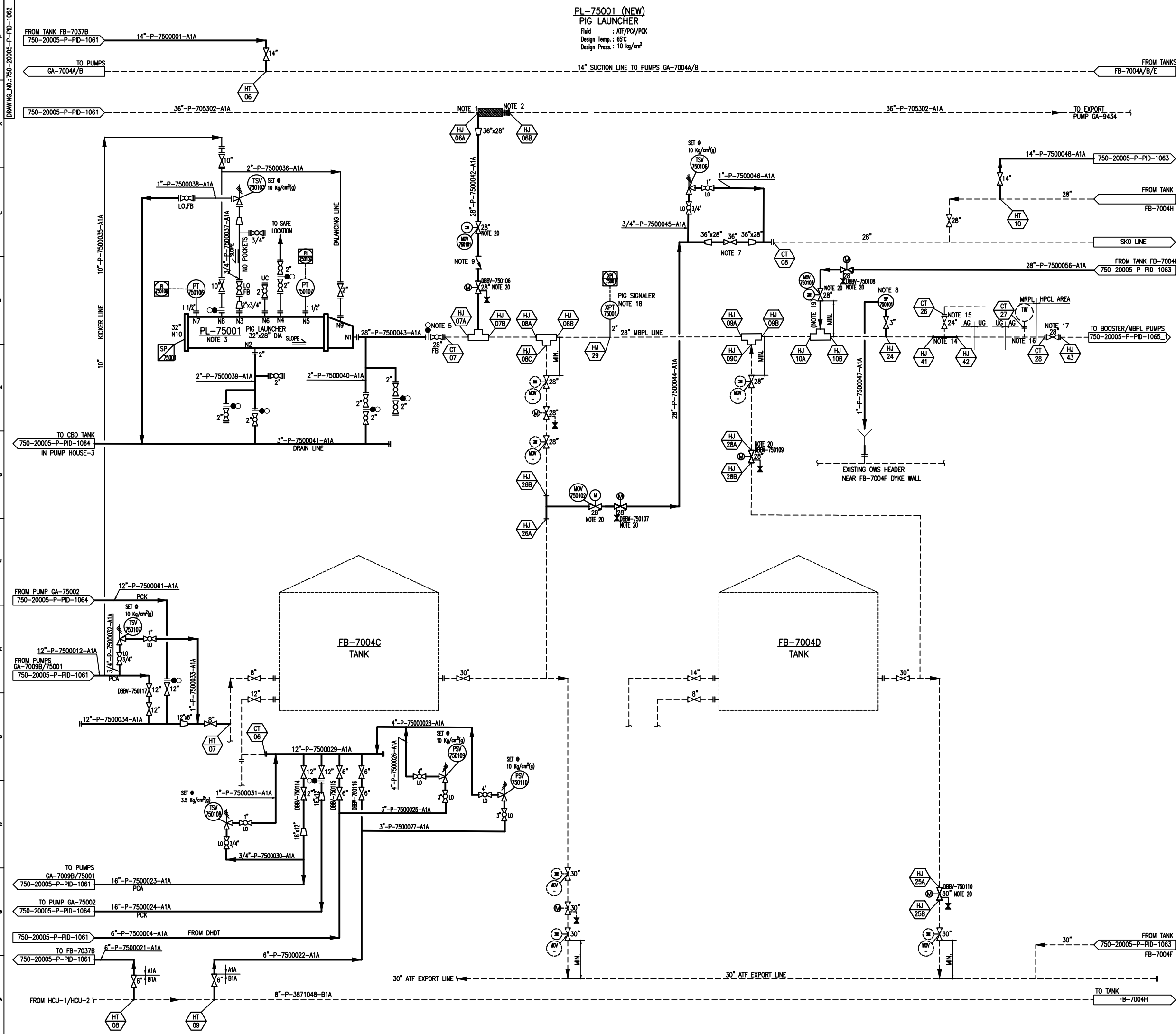


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DRAWING NO.: 750-20005-P-PID-1061



**PL-75001 (NEW)  
PIG LAUNCHER**  
Fluid : ATF/PCA/PCK  
Design Temp. : 65°C  
Design Press. : 10 kg/cm<sup>2</sup>



- NOTES**
- EXISTING 36" LINE SHALL BE DISCONNECTED AND NEW ELBOW AND REDUCER 36"x28" SHALL BE PROVIDED.
  - EXISTING 36" LINE SHALL BE DISCONNECTED AND NEW 36" FLANGE AND BLIND FLANGE SHALL BE PROVIDED.
  - SUITABLE PIG HANDLING FACILITY SHALL BE PROVIDED.
  - DELETED.
  - VALVE TO BE LOCATED AS CLOSE AS POSSIBLE TO PIG LAUNCHER.
  - PIG TRAP DOOR OPENING MECHANISM TO BE SO CONSTRUCTED THAT THE DOOR CANNOT BE OPENED UNLESS IT IS FULLY DEPRESSURIZED.
  - 36" VALVE REMOVED FROM THE EXISTING LINE FROM TANK FB-7037 SHALL BE UTILIZED.
  - PRODUCT SAMPLING SYSTEM SHALL BE PROVIDED AND IT'S OUTLET SHALL BE CONNECTED TO NEAR BY OWS PIPELINE.
  - LOW PRESSURE DROP NRV (CHECK VALVE).
  - ALL EQUIPMENT, LINES, INSTRUMENTS, MOV'S AND DBBV TAG NUMBERS START WITH 750 ARE NEW ITEMS.
  - ALL NEW INSTRUMENTS TAG NUMBERS SHALL BE PREFIXED WITH UNIT No. 750.
  - LINES/POCKETS SHALL BE PROVIDED WITH LOW POINT DRAINS.
  - TANK FARM PIPING MANIFOLDS SHALL BE LOCATED OUTSIDE THE TANK DYKE & AREA BENEATH TO BE PAVED & SLOPED TOWARDS OILY WATER SEWER.
  - EXISTING 24" TEE SHALL BE REMOVED AND 28" LINE SHALL BE MADE THROUGH BY WELDING 28" PIPE SPOOL.
  - EXISTING 24" VALVE SHALL BE DISMANTLED AND BLINDED WITH NEW 24" BLIND FLANGE, GASKET, NUTS & BOLTS.
  - EXISTING 1" THERMOWELL SHALL BE REMOVED AND THE NOZZLE SHALL BE BLINDED WITH NEW BLIND FLANGE, GASKET, NUTS & BOLTS.
  - EXISTING 28" GATE VALVE (INSIDE HPCL PREMISES) SHALL BE DISMANTLED AND NEW 28" FULL BORE BALL VALVE SHALL BE INSTALLED.
  - PIG SIGNALER SHALL BE INTRUSIVE TYPE.
  - THE EXISTING 28" SIZE 45" ELBOW, SPOOL ALONG WITH FLANGE SHALL BE REUSED EXCEPT THE BLIND FLANGE.
  - FOR MOV/MOTORIZED DBBV SIGNALS TO DCS/PLC REFER TO -750-20005-P-PID-1060 Sht 2 of 2.

**LEGENDS.**

- HOT TAPPING
- HOT JOINT
- COLD TAPPING/JOINT
- DEMOLITION
- EXISTING
- NEW/PROPOSED

SLNO	REV.	TITLE
<b>REFERENCE DRAWINGS</b>		
0	01-JUL-22	ISSUED FOR DESIGN
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A	25-MAR-22	ISSUED FOR REVIEW

CLIENT:  
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PROJECT:  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES**

PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7004C/7004D**

TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1062	1 OF 1	0	1:1

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**FB-7004F (MODIFIED)**  
 ATF STORAGE TANK  
 Fluid : ATF  
 Size : 48.5m (D) x 20m (H)  
 Design Temperature : 65 °C  
 Type : (INTERNAL FLOATING ROOFTANK) NOTE 1  
 Pump In-Rate : 300 M<sup>3</sup>/hr  
 Pump Out-Rate : 2800 M<sup>3</sup>/hr

**EG-7004F (EXISTING)**  
 JET MIXER  
 Flow : 300 M<sup>3</sup>/hr  
 Design Pressure : 9.0 KG/CM<sup>2</sup>  
 Design Temperature : 65 °C

- EXISTING TANK FB-7004F EXTERNAL FLOATING TYPE ROOF SHALL BE CONVERTED TO INTERNAL FLOATING ROOF AND NEW FIXED CONE ROOF SHALL BE PROVIDED (DUAL ROOF TANK). ALL EXISTING INSTRUMENTS SHALL BE RE-USED.
- DELETED.
- NEW SS DIP HATCH SHALL BE PROVIDED.
- PT 705201 IS FOR DENSITY MEASUREMENT ALSO.
- EXISTING VALVES TO BE REMOVED AND BOTH SIDE PIPES TO BE BUNDED.
- ONE OF THE EXISTING ISOLATION VALVE AND SPECTACLE BLIND SHALL BE REPLACED WITH DBBV.
- ALL EQUIPMENT, LINES, INSTRUMENTS, MOVES AND DBBV TAG NUMBERS START WITH 750 ARE NEW ITEMS.
- ALL NEW INSTRUMENTS TAG NUMBERS SHALL BE PREFIXED WITH UNIT No. 750.
- MODIFIED TANK SHALL BE PROVIDED WITH FOAM SYSTEM (SINKING ROOF)
- ALL LINES/POCKETS SHALL BE PROVIDED WITH LOW POINT DRAINS.
- TANK FARM PIPING MANIFOLDS SHALL BE LOCATED OUTSIDE THE TANK DYKE & AREA BENEATH TO BE PAVED & CLOSED TOWARDS ONLY WATER SEWER.
- FOR MOV/MOTORIZED DBBV SIGNALS TO DCS/PLC REFER TO -750-20005-P-PID-1060 Sht 2 of 2.

LEGENDS.

- HOT TAPPING
- HOT JOINT
- COLD TAPPING/JOINT
- DEMOLITION
- EXISTING
- NEW/PROPOSED

SLNO	REV.	TITLE
REFERENCE DRAWINGS		

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
0	01-JUL-22	ISSUED FOR DESIGN				
B	17-JUN-22	ISSUED FOR APPROVAL				
A	25-MAR-22	ISSUED FOR REVIEW				

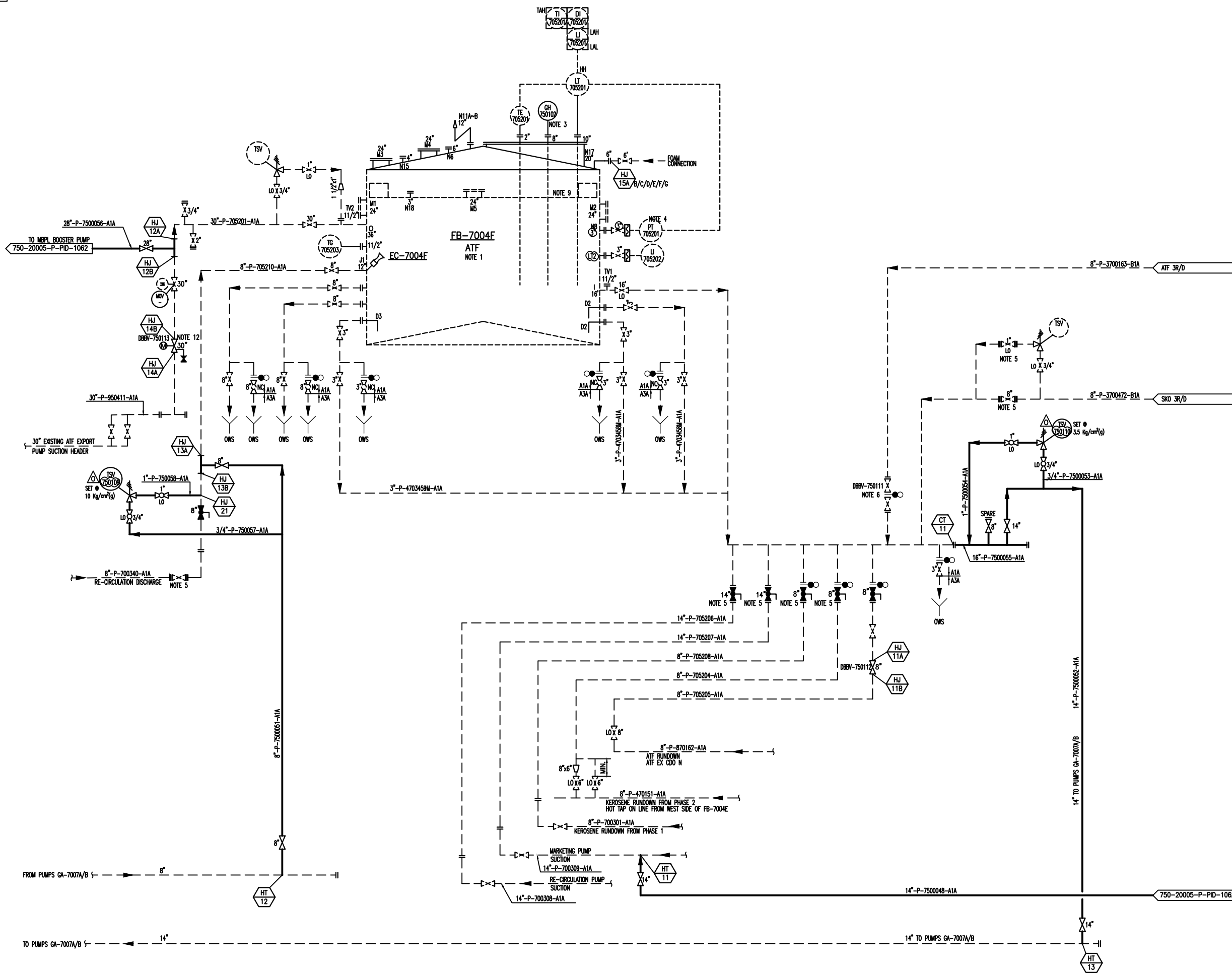
CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES**

PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM FOR TANK FB-7004F**

TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1063	1 OF 1	0	1:1



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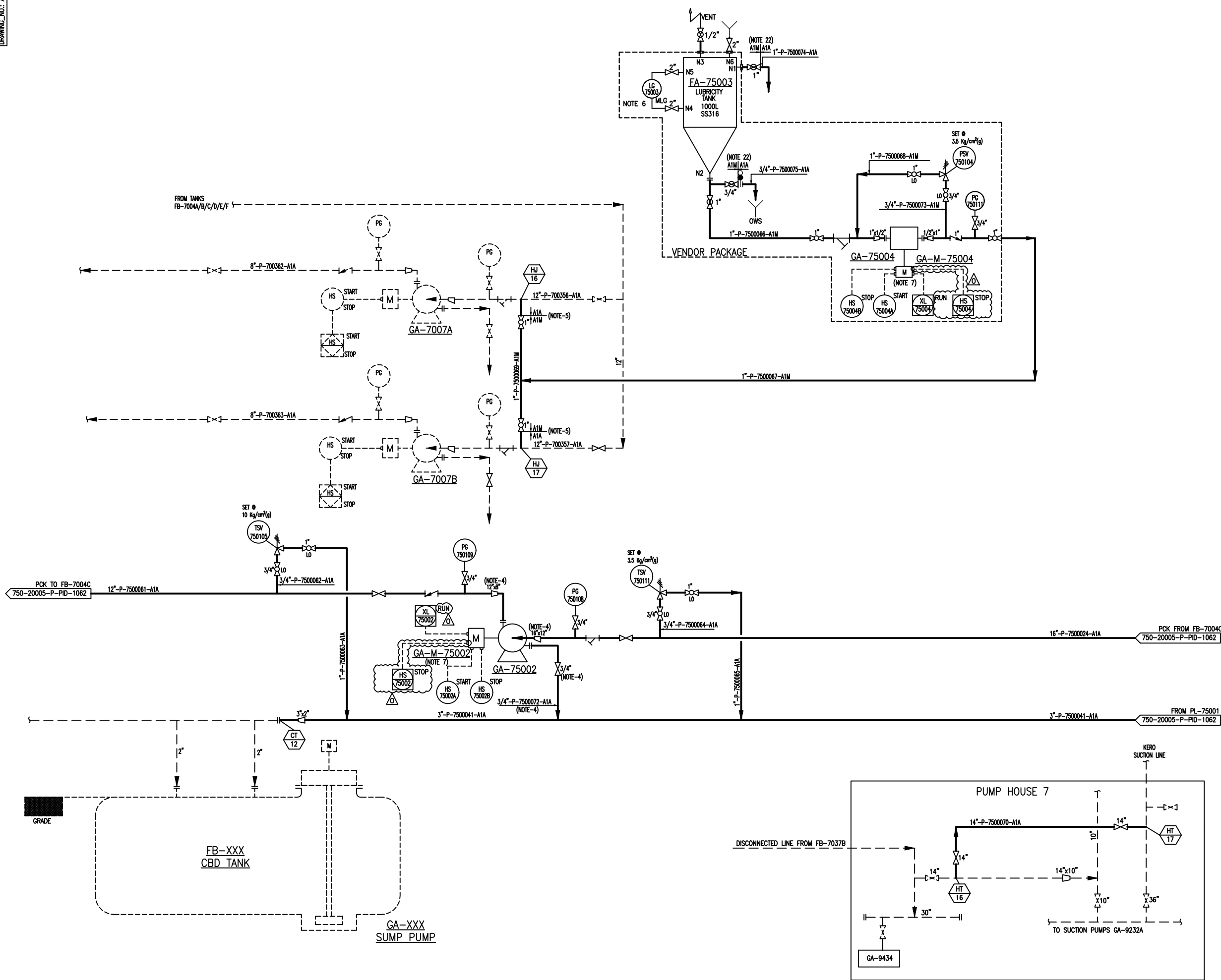
DRAWING NO.: 750-20005-P-PID-1063



DRAWING NO.: 750-20005-P-PID-1064

GA-75002 (NEW)	GA-7007A/B (1W+1S) (EXISTING)	FA-75003 (NEW)	GA-75004 (NEW)
PCK CIRCULATION PUMPS	ATF TRANSFER PUMPS	LUBRICITY DOSING TANK	LUBRICITY DOSING PUMP
Fluid : PCK	Fluid : ATF	Fluid : NALCO LUBRICITY ADDITIVE	Capacity : 0.1-1 M <sup>3</sup> /hr
Capacity : 300 M <sup>3</sup> /hr	Capacity : 300 M <sup>3</sup> /hr	Design Pressure : ATM + FULL OF LIQUID	Differential pressure : 2.0 kg/cm <sup>2</sup>
Differential pressure : 5.5 kg/cm <sup>2</sup>	Differential pressure : 5.5 kg/cm <sup>2</sup>	Design Temperature : 65 °C	Type : metering pump
Type : Horizontal Centrifugal Pump	Type : Horizontal Centrifugal Pump		

- NOTES**
- ALL EQUIPMENT, LINES, INSTRUMENTS, MOVES AND DEVS TAG NUMBERS START WITH 750 ARE NEW ITEMS.
  - ALL NEW INSTRUMENTS TAG NUMBERS SHALL BE PREFIXED WITH UNIT No. 750.
  - ALL LINES/POCKETS SHALL BE PROVIDED WITH LOW POINT DRAINS.
  - HOLD FOR VENDER DATA.
  - INSULATING GASKETS (MATERIAL-PHENOLIC) TO BE CONSIDERED FOR DISSIMILAR METAL FLANGES.
  - MAGNETIC TYPE LEVEL GAUGE.
  - FOR MOTOR SIGNAL CONNECTIONS REFER TO LEGEND P&ID 750-20005-P-PID-1060 Sht 2 of 2.



- LEGENDS.**
- HT XX: HOT TAPPING
  - CT XX: COLD TAPPING/JOINT
  - : EXISTING
  - : NEW/PROPOSED
  - DEMOLITION: (Hatched area)
  - HJ XX: HOT JOINT

SLNO	REV.	TITLE
REFERENCE DRAWINGS		
0	01-JUL-22	ISSUED FOR DESIGN
B	17-JUN-22	ISSUED FOR APPROVAL
A	25-MAR-22	ISSUED FOR REVIEW

CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES**

PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PIPING AND INSTRUMENTATION DIAGRAM FOR LUBRICITY DOSING SYSTEM AND PCK CIRCULATION PUMP**

TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
-	750-20005-P-PID-1064	1 OF 1	0	1:1

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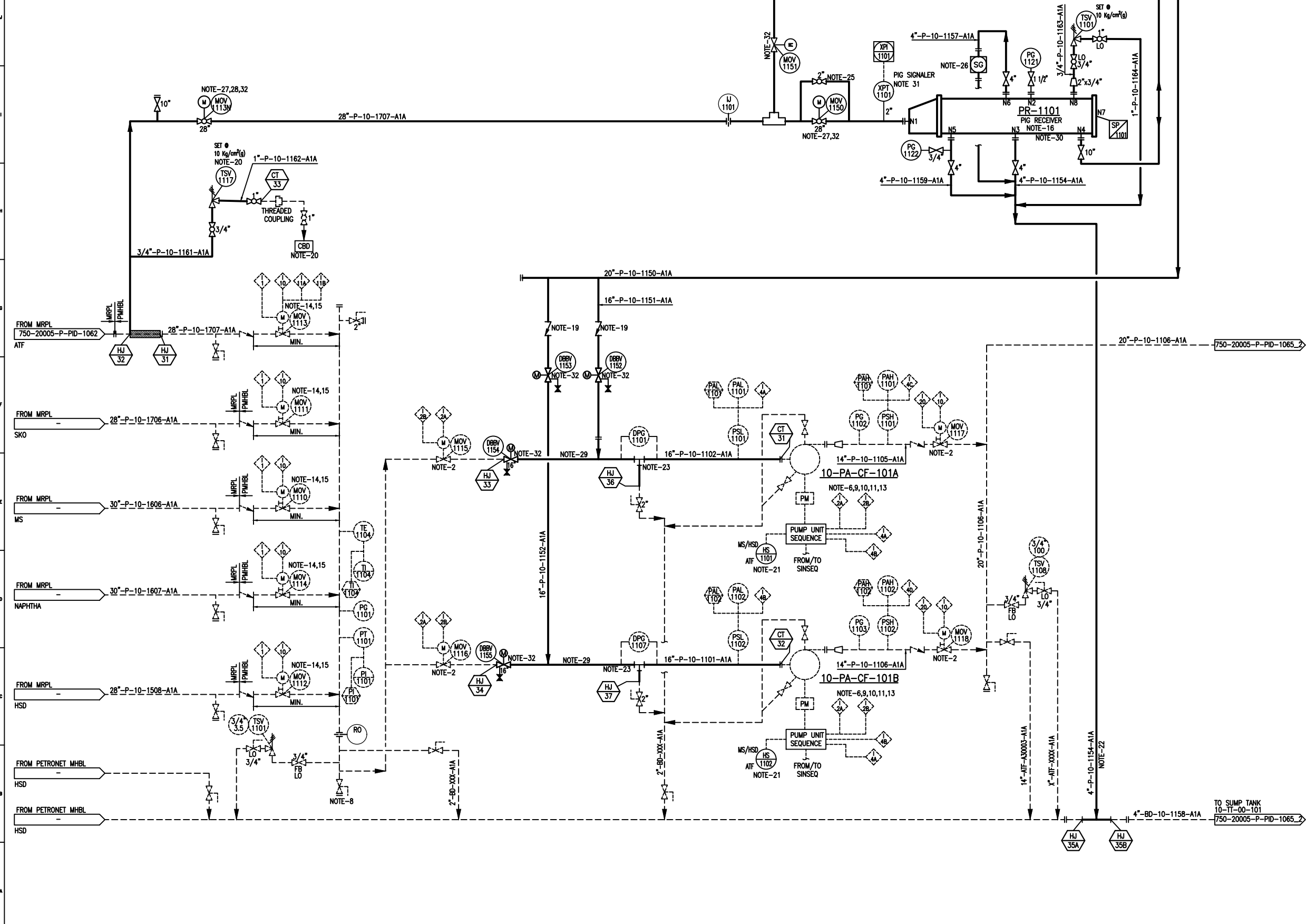
- NEW NOTES:**
16. PIG RECEIVER SHALL BE LOCATED IN THE EXISTING PMHBL PUMP STATION & PIG LAUNCHER SHALL BE LOCATED AT MRPL (NEAR TANK TD-7004C).
  17. THE DBBY SHALL BE LOCATED AS CLOSE TO THE PUMPS SUCTION AS POSSIBLE.
  18. PROMOTION FOR SAMPLING AND DRAIN FROM SAMPLING SYSTEM SHALL BE ROUTED TO EXISTING CBD NETWORK.
  19. DUAL PLATE CHECK VALVE (LOW PRESSURE DROP).
  20. THE EXISTING TSV ON ATF LINE TO BE RELOCATED TO UPSTREAM OF NEW MOV-1113N & TSV DISCHARGE SHALL BE CONNECTED TO EXISTING TSVs COMMON DISCHARGE HEADER.
  21. EXISTING INTERLOCKS RELATED TO BOOSTER PUMPS TO BE MODIFIED, SELECTOR SWITCH HS-1101/1102 SHALL BE PROVIDED FOR ATF MODE & MS/HSD MODE SELECTION.
  22. ALL THE DRAINS AND TSV DISCHARGE LINES SHALL BE COLLECTED IN COMMON HEADER AND TO BE CONNECTED TO EXISTING CBD HEADER 4"-BD-10-1158-A1A.
  23. EXISTING T-STRAINER (WELDED) TO BE REPLACED AND RELOCATED TO MAKE SPACE FOR NEW DBBY.
  24. VENT WITH BLIND FLANGE.
  25. PRESSURE EQUALIZATION LINE (2") ACROSS MOV-1150.
  26. SIGHT/VIEW GLASS.
  27. MOV-1113N & MOV-1150 SHALL BE FULL BORE BALL VALVE.
  28. ON THE INITIATION OF ESD AT PMHBL, MOV-1113N SHALL BE CLOSED (HAZOP RECOMMENDATION).
  29. BOTH THE EXISTING 16" SUCTION LINES SHALL BE MODIFIED TO ACCOMMODATE NEW DBBYs, NEW STRAINERS AND RELOCATING THE EXISTING INSTRUMENTS LIKE DPG, PSL, ETC.
  30. SUITABLE PIG HANDLING FACILITY SHALL BE PROVIDED.
  31. PIG SIGNALER SHALL BE INTRUSIVE TYPE.
  32. FOR MOV/MOTORIZED DBBY SIGNALS TO DCS/PLC REFER TO LEGEND P&ID-750-20005-P-PID-1060\_Sht. 2 of 2.

**10-PA-CF-101A/B(1W+1S) (EXISTING)**  
**PUMPS**  
 Fluid : MS/HSD/ATF/SKO/NAPHTHA  
 Capacity min./Nor/Rated : 675/877/877 m<sup>3</sup>/hr  
 Operating Temp. : 35-50°C  
 Operating Press. : 1-3 kg/cm<sup>2</sup>A  
 Differential Head : 60 MLC  
 Type : Horizontal Centrifugal Pump

**PR-1101 (NEW)**  
**PIG RECEIVER**  
 Fluid : ATF/PCA/PCK  
 Design Temp. : 65°C  
 Design Press. : 10 kg/cm<sup>2</sup>

- HOT JOINT
- HOT TAPPING
- COLD TAPPING/JOINT

- NOTES**
1. UNIT NO '10' TO BE ADDED AS PREFIXED TO ALL INSTRUMENTS APPEARING IN THIS P&ID.
  2. THIS MOV WILL BE OPERABLE FROM FIELD & SMCs. FOR MOV LEGEND IS SHOWN IN P&ID No.3997-10-41-1101(DETAIL-1/2).
  3. THIS MOV WILL BE OPERABLE FROM FIELD & CONTROL ROOM. FOR MOV LEGEND REFER P&ID No.3997-10-41-1101(DETAIL-1/1).
  4. PROVIDE ADEQUATE SLOPE ON ALL BLOWDOWN LINE FOR SMOOTH GRAVITY FLOW.
  5. THE FOLLOWING MINIMUM INDICATION SHALL BE AVAILABLE IN THE FLOW COMPUTER LOG.
  6. ALL SIGNAL FOR HEALTH MONITORING/BEARING/WINDING TEMPERATURE ETC.) AND CONTROL OF THE PUMP SHALL BE PROVIDED IN THE PUMP UNIT CONTROL PANEL LOCATED IN CONTROL PANEL ROOM. UCP SHALL ALSO CARRYOUT TRIPS DUE TO HIGH BEARING/WINDING TEMPERATURE, ELECTRICAL FAULT AND PUMP VIBRATION.
  7. THE DENATOR AND FLOW STRENGTHENER WILL BE SUPPLIED BY TURBINE VENDOR.
  8. THE VALVE SHALL BE PROVIDED WITH MOTOR ACTUATOR DURING PHASE-2 OPERATIONS.
  9. PUMP UCP SHALL BE IN PUMP VENDOR SCOPE.
  10. ALARM FOR PUMP FAIL TO TRIP SHALL BE PROVIDED IN CONTROL ROOM.
  11. COMPANION FLANGES FOR PUMP SHALL BE PROVIDED BY PUMP VENDOR.
  12. FUTURE CONNECTION FOR METER PROVING.
  13. FOR VENDOR SCOPE OF WORK REFER LEGEND P&ID No.3997-10-02-41-1102.
  14. PROVIDE ALARM PUSH BUTTON FOR MOV-1110,MOV-1111,MOV-1112,MOV-1113,MOV-1114 & COMMON DISCHARGE PUSH BUTTON FOR THE ABOVE MOVs.
  15. AN ADDITIONAL 25X OPEN POSITION SWITCH SHALL BE PROVIDED FOR MOV-1110,1111,1112,1113&1114.



**INTER LOCK ACTUATED BY ACTION**

LOGIC	OPENING COMMAND FOR (ANY OF THE ABOVE)	OPEN DESIRED PRODUCT HEADER VALVE & CLOSE OTHER OPENED PRODUCT HEADER VALVE
I-1	MOV-1110/1111/1112/1113/1114	OPEN DESIRED PRODUCT HEADER VALVE & CLOSE OTHER OPENED PRODUCT HEADER VALVE
THIS INTERLOCK WILL NOT ALLOW OPENING UP TO TWO PRODUCT HEADER VALVE AT THE SAME POINT.		
I-2A	PUMP UNIT START-UP PUSH BUTTON 10-BP-101	BRING MOV-1115 TO OPEN AND MOV-1117 TO CLOSE POSITION
I-2B	PUMP UNIT START-UP PUSH BUTTON 10-BP-101 B1 OR HSH-101 B1	BRING MOV-1116 TO OPEN AND MOV-1118 TO CLOSE POSITION
I-3A	TRIPPING OF PA-CF-101A	CLOSE MOV-1117 & MOV-1115
I-3B	TRIPPING OF PA-CF-101B	CLOSE MOV-1118 & MOV-1116
I-4A	PSL-1101	TRIP PA-CF-101A
I-4B	PSL-1110	TRIP PA-CF-101B
I-4C	PSH-1101	TRIP PA-CF-101A
I-4D	PSH-1110	TRIP PA-CF-101B
I-7	LSL-1101	TRIP SUMP PUMP PA-SM-101
I-11A	OPENING COMMAND FOR MOV-1113	OPEN MOV-1123 & MOV-1125 CLOSE MOV-1124
I-11B	CLOSING COMMAND FOR MOV-1113	OPEN MOV-1123 & MOV-1125 CLOSE MOV-1124

INTERLOCK BY-PASS SHALL BE PROVIDED FOR I-4C & I-4D ON PANEL WITH INDICATION  
 DISCHARGE MOV OF RESPECTIVE PUMP SHALL OPEN AFTER TIME LOG WITH RESPECT TO THE INDIVIDUAL PUMP UNIT START-UP.

- LEGENDS:**
- CHV
  - GATE VALVE
  - NEEDLE VALVE
  - BASKET STRAINER
  - BUTTERFLY VALVE
  - BALL VALVE
  - AUTO RECIRCULATION VALVE
  - MOTORISED DOUBLE BLOCK BLEED VALVE
  - OPEN DRAIN FUNNEL
  - FIELD INSTRUMENTS INDIVIDUALLY SPECIFIED
  - BLIND FLANGE
  - MOV (GATE VALVE)
  - MOTOR
  - INTERLOCK
  - DEMOLITION
  - EXISTING
  - NEW/PROPOSED

**REFERENCE DRAWINGS**

SLNO	DRAWING NO.	REV.	TITLE
1	10-02-41-111A-1	1	BOOSTER PUMPS AND METERING(PMHBL DWG.)

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
B	17-JUN-22	ISSUED FOR APPROVAL				
A	25-MAR-22	ISSUED FOR REVIEW				

**CLIENT:**  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

**PROJECT:**  
**TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES/PMHBL**

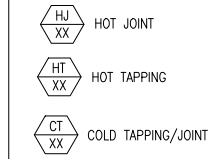
**PROJECT MANAGEMENT CONSULTANT:**  
**NAUVATA ENGINEERING PVT. LTD.**

**DRAWING TITLE:**  
**PIPING AND INSTRUMENTATION DIAGRAM BOOSTER PUMPS AND METERING**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
	750-20005-P-PID-1065	1 OF 2	B	1:1

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- NOTES**
- UNIT NO '10' TO BE ADDED AS PREFIX TO ALL INSTRUMENTS APPEARING IN THIS P&ID.
  - THIS MOV WILL BE OPERABLE FROM FIELD & SMCs. FOR MOV LEGEND IS SHOWN IN P&ID No.3997-10-41-1101(DETAIL-1/2).
  - THIS MOV WILL BE OPERABLE FROM FIELD & CONTROL ROOM. FOR MOV LEGEND REFER P&ID No.3997-10-41-1101(DETAIL-1/1).
  - PROVIDE ADEQUATE SLOPE ON ALL BLOWDOWN LINE FOR SMOOTH GRAVITY FLOW.
  - THE FOLLOWING MINIMUM INDICATION SHALL BE AVAILABLE IN THE FLOW COMPUTER LOG.
  - ALL SIGNAL FOR HEALTH MONITORING/BEARING/WINDING TEMPERATURE ETC.) AND CONTROL OF THE PUMP SHALL BE PROVIDED IN THE PUMP UNIT CONTROL PANEL LOCATED IN CONTROL PANEL ROOM. UCP SHALL ALSO CARRYOUT TRIPS DUE TO HIGH BEARING/WINDING TEMPERATURE, ELECTRICAL FAULT AND PUMP VIBRATION.
  - THE DEARATOR AND FLOW STRENGTHENER WILL BE SUPPLIED BY TURBINE VENDOR.
  - THE VALVE SHALL BE PROVIDED WITH MOTOR ACTUATOR DURING PHASE-2 OPERATIONS.
  - PUMP UCP SHALL BE IN PUMP VENDOR SCOPE.
  - ALARM FOR PUMP FAIL TO TRIP SHALL BE PROVIDED IN CONTROL ROOM.
  - COMPANION FLANGES FOR PUMP SHALL BE PROVIDED BY PUMP VENDOR.
  - FUTURE CONNECTION FOR METER PROVING.
  - FOR VENDOR SCOPE OF WORK REFER LEGEND P&ID No.3997-10-02-41-1102.
  - PROVIDE ALARM PUSH BUTTON FOR MOV-1110,MOV-1111,MOV-1112,MOV-1113,MOV-1114 & COMMON DISCHARGE PUSH BUTTON FOR THE ABOVE MOV'S.
  - AN ADDITIONAL 25% OPEN POSITION SWITCH SHALL BE PROVIDED FOR MOV-1110,1111,1112,1113&1114.



**INTER LOCK LOGIC**

LOGIC	ACTUATED BY	ACTION
I-1	OPENING COMMAND FOR MOV-1110/1111/1112/1113/1114 (ANY OF THE ABOVE)	OPEN DESIRED PRODUCT HEADER VALVE & CLOSE OTHER OPENED PRODUCT HEADER VALVE
THIS INTERLOCK WILL NOT ALLOW OPENING UP TO TWO PRODUCT HEADER VALVE AT THE SAME POINT.		
I-2A	PUMP UNIT START-UP PUSH BUTTON 10-BP-101	BRING MOV-1115 TO OPEN AND MOV-1117 TO CLOSE POSITION
I-2B	PUMP UNIT START-UP PUSH BUTTON 10-BP-101 B1 OR HSH-101 B1	BRING MOV-1116 TO OPEN AND MOV-1118 TO CLOSE POSITION
I-3A	TRIPPING OF PA-CF-101A	CLOSE MOV-1117 & MOV-1115
I-3B	TRIPPING OF PA-CF-101B	CLOSE MOV-1118 & MOV-1116
I-4A	PSL-1101	TRIP PA-CF-101A
I-4B	PSL-1110	TRIP PA-CF-101B
I-4C	PSH-1101	TRIP PA-CF-101A
I-4D	PSH-1110	TRIP PA-CF-101B
I-7	LSL-1101	TRIP SUMP PUMP PA-SM-101
I-11A	OPENING COMMAND FOR MOV-1113	OPEN MOV-1123 & MOV-1125 CLOSE MOV-1124
I-11B	CLOSING COMMAND FOR MOV-1113	OPEN MOV-1123 & MOV-1125 CLOSE MOV-1124

INTERLOCK BY-PASS SHALL BE PROVIDED FOR I-4C & I-4D ON PANEL WITH INDICATION  
DISCHARGE MOV OF RESPECTIVE PUMP SHALL OPEN AFTER TIME LOG WITH RESPECT TO THE INDIVIDUAL PUMP UNIT START-UP.

**LEGENDS.**

	CHV		OPEN DRAIN FUNNEL
	GATE VALVE		FIELD INSTRUMENTS INDIVIDUALLY SPECIFIED
	NEEDLE VALVE		BLIND FLANGE
	BASKET STRAINER		MOV (GATE VALVE)
	BUTTERFLY VALVE		MOTOR
	BALL VALVE		INTERLOCK
	AUTO RECIRCULATION VALVE		EXISTING
	MOTORISED DOUBLE BLOCK BLEED VALVE		NEW/PROPOSED

**REFERENCE DRAWINGS**

SL.NO	REV.	TITLE
1	1	BOOSTER PUMPS AND METERING(PMHBL DWG.)

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
B	17-JUN-22	ISSUED FOR APPROVAL	SPS	SK/PM	NSN	
A	25-MAR-22	ISSUED FOR REVIEW	SPS	SK/PM	NSN	

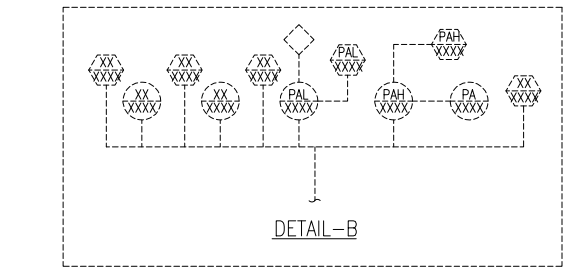
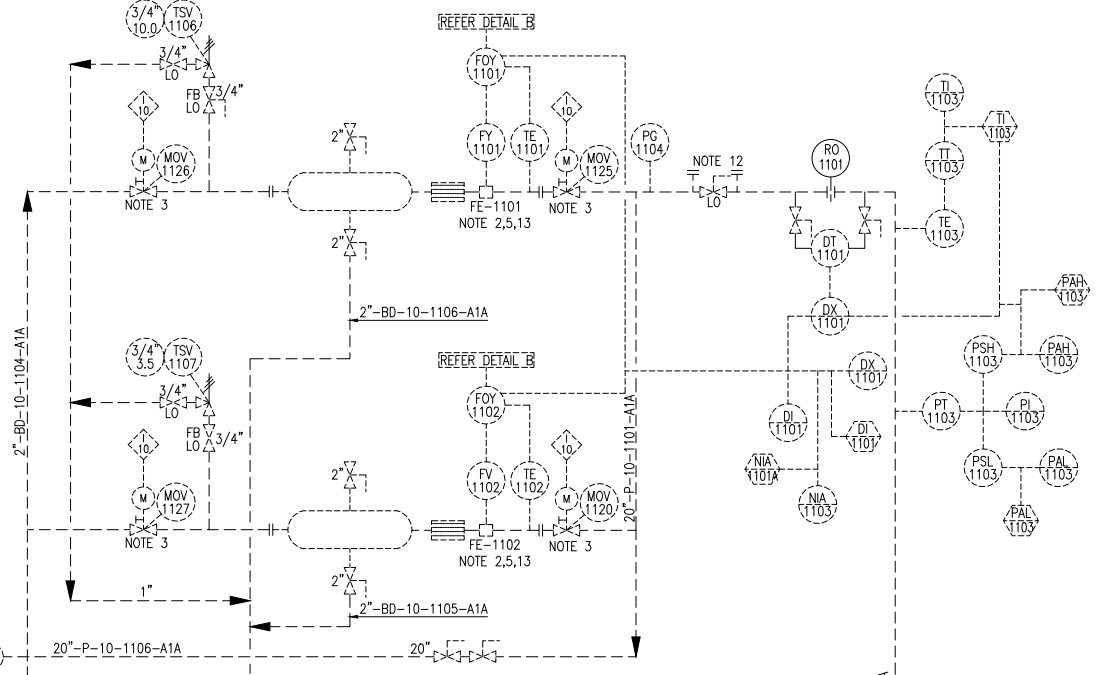
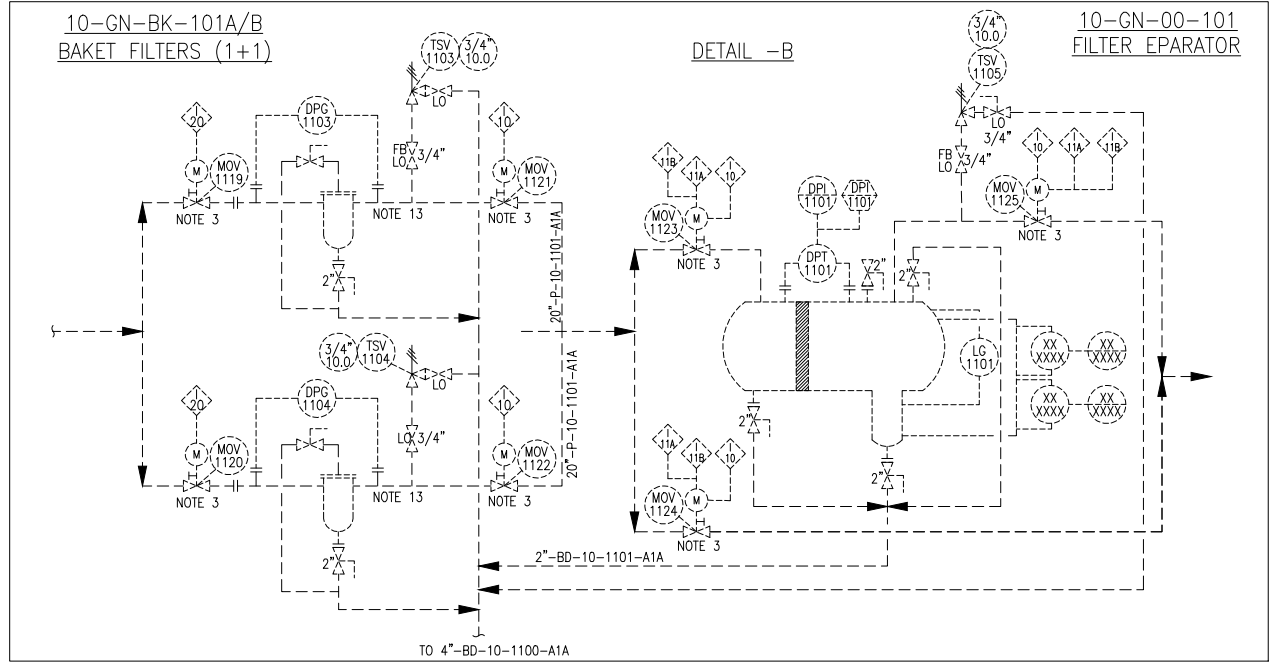
CLIENT: **ONGC MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT: **TANK CONVERSION AND ASSOCIATED MECHANICAL WORKS AT MANGALORE REFINERY PREMISES/PMHBL**

PROJECT MANAGEMENT CONSULTANT: **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE: **PIPING AND INSTRUMENTATION DIAGRAM BOOSTER PUMPS AND METERING**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
750-20005-P-PID-1065	750-20005-P-PID-1065	2 OF 2	B	1:1



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