
	<p style="text-align: center;"><b>MRPL Marketing Terminal Project at Devangonhi, Bangalore Marketing Infrastructure Projects, MRPL.</b></p> <p style="text-align: center;"><b>LSTK-B PACKAGE: CIVIL AND STRUCTURAL WORKS ADDENDUM 02</b></p>	
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**ADDENDUM 02**

**To**

**MRPL Tender No. 3200000490 dated 26.02.2021**

**TENDER FOR CIVIL AND STRUCTURAL WORKS (LSTK-B PACKAGE) MRPL MARKETING TERMINAL PROJECT  
AT DEVANGONTHI, BANGALORE MARKETING INFRASTRUCTURE PROJECTS, MRPL**

**With reference to the above tender and Addendum 01, Bidders are requested to note the following:**



The items, conditions, specification and stipulations of the Bidding Documents are modified to the extent indicated in

- i. Annexure 1: Commercial Addendum**
- ii. Annexure 2: Technical Addendum**

The implications of the same, elsewhere in the tender shall be taken care of appropriately by the bidders. All other terms and conditions, stipulations and specifications of tender shall remain unaltered.

**Note:**



Bidders shall upload the copy of these documents along with the technical- commercial bid **duly DIGITALLY signed** as a token of having read and understood the same.



	<b>MRPL Marketing Terminal Project at Devangonhi, Bangalore</b> <b>Marketing Infrastructure Projects, MRPL.</b>	
	<b>LSTK-B PACKAGE: CIVIL AND STRUCTURAL WORKS</b> <b>ADDENDUM 02</b>	



**Annexure 01 – Commercial Addendum**

Sl. No.	Volume	Section No./Clause No.	Page No. as per document uploaded as Addendum-01	Existing Tender Clause	Addition / Deletion / Modification
1.	Volume I, Commercial Section.	<a href="https://www.tenderwizar.com/MRPL">https://www.tenderwizar.com/MRPL</a> On the Tender Wizard screen, the cost open date and time is shown as 18.03.2021, 16:00hrs  Part I – Techno-Commercial Part Notice Inviting Tender (NIT)	12 of 2784	NIT Salient Features (Sl.No.12)	On the tender website screen the Price Bid/Cost open date and time has come up inadvertently due to an error. Bidders to kindly ignore it.  For Price Bid opening date please refer to NIT Salient Features (Sl.No.12) as per which  Price Bid Opening - Date & time shall be intimated later to the qualified and acceptable Bidders.
2.	Volume I, Commercial Section.	Part I – Techno-Commercial Part Notice Inviting Tender (NIT), Sl.No. 8 : Bid closing date / time	11 of 2784	18.03.2021 @ 15:00 Hrs	<b>Upto 31.03.2021 @ 15:00 Hrs (IST)</b>
3.	Volume I, Commercial Section.	Part I – Techno-Commercial Part Notice Inviting Tender (NIT), Sl.No. 9 : Date/ Time of Technical Bid opening	11 of 2784	18.03.2021 @ 16:00 Hrs	<b>Unpriced Online Bid Opening date : 31.03.2021 at 15:30 Hrs (IST)</b>



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Sl. No.	Volume	Section No./Clause No.	Page No. as per document uploaded as Addendum-01	Existing Tender Clause	Addition / Deletion / Modification	
4.	Volume I, Commercial Section.	Part I: techno-commercial SCC, clause 1.6	450 of 2784	<p>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 Prices, the following shall prevail to the extent of such irreconcilable conflict in descending order of precedence:</p> <ol style="list-style-type: none"> <li>i. Formal Contract</li> <li>ii. Detailed Letter of Acceptance</li> <li>iii. Letter of Acceptance</li> <li>iv. Schedule of Price / Lumpsum Schedule of Price</li> <li>v. Special Conditions of Contract</li> <li>vi. Scope of works/Job Design Basis/Particular Specification.</li> <li>vii. Drawings</li> <li>viii. Technical/ Material Specifications/Engineering Design Basis.</li> <li>ix. Instructions to Bidders</li> <li>x. General Conditions of Contract.</li> <li>xi. Standard Specifications.</li> <li>xii. Indian Standards.</li> <li>xiii. Other applicable Standards.</li> </ol>	<p><b>Shall be read as</b></p> <p>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 Prices, the following shall prevail to the extent of such irreconcilable conflict in descending order of precedence:</p> <ol style="list-style-type: none"> <li>i. Formal contract</li> <li>ii. Detailed Letter of Acceptance</li> <li>iii. Letter of Acceptance</li> <li>iv. Schedule of Price / Lumpsum Schedule of Price</li> <li>v. Special Conditions of Contract</li> <li>vi. Scope of works</li> <li>vii. Drawings</li> <li>viii. Job Design basis /Engineering Design Basis</li> <li>ix. Technical/ Material specifications / Particular Specification.</li> <li>x. Instructions to Bidders.</li> <li>xi. General Conditions of Contract.</li> <li>xii. Standard Specifications.</li> <li>xiii. Indian Standards.</li> <li>xiv. Other applicable standards.</li> </ol>	

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5.	Volume I, Commercial Section.	Part I: techno-commercial SCC 27.0 ( Price adjustment for slippage in Mechanical completion	469 of 2784	<p>1. The Clause No. 4.4.0.0.of GCC stand partially modified to the following extent:</p> <p>In case of any delay in <b>MECHANICAL COMPLETION OF THE LSTK-B PACKAGE</b> beyond the Time schedule as defined in Table A of <b>Annexure I</b> to SCC, the Owner shall be entitled to a discount in the total Lump sum price (SOP). The discount shall be applicable at the rate of 0.5% (half percent) of the total Lump sum price of LSTK-B Contract for every week of the delay or part thereof subject to a maximum of 5% of the total Lump sum price of LSTK-B Contract. 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.</p> <p>2. Price Adjustment, if applicable, shall be made only after settlement of the contractor request for time extension.</p>	<p><b>Shall be read as:-</b></p> <p>1. The Clause No. 4.4.0.0.of GCC stand partially modified to the following extent:</p> <p>In case of any delay in <b>MECHANICAL COMPLETION OF THE LSTK-B PACKAGE</b> beyond the Time schedule as defined in Table A of <b>Annexure I</b> to SCC, the Owner shall be entitled to a discount in the total Lump sum price (SOP). The discount shall be applicable at the rate of 0.5% (half percent) of the total Lump sum price of LSTK-B Contract for every week of the delay or part thereof subject to a maximum of 5% of the total Lump sum price of LSTK-B Contract. 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.</p> <p>2. In case price adjustment is applicable, contractor can submit a Bank Guarantee, for the amount of the price adjustment after request for time extension OR as an alternative the contractor may have an option to provide a Bank Guarantee for a sum equal to 5% (FIVE Percent) of the total contract value from a</p>	



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				<p>Until finalization of this aspect, whether price adjustment or extension of time schedule, the contractor shall submit a bank guarantee for the amount of price adjustment, in a format approved by OWNER</p> <p>3. As an alternative the contractor shall have an option to provide a Bank Guarantee from a scheduled Bank and in a format acceptable to the OWNER for a sum equal to 5% (FIVE Percent) of the total contract value which shall be available for recovery of the Price Adjustment for Slippage in completion (if any) finally determined after MECHANICAL COMPLETION OF THE LSTK-B Package. 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 Mechanical completion or 18 months from date of Commissioning whichever is earlier.</p> <p>4. In case the Contractor submits a BG in lieu of "Price Adjustment for slippage</p>	<p>scheduled Bank and in a format acceptable to the OWNER. The bank guarantee submitted towards price adjustment shall be available for recovery of the Price Adjustment for Slippage in completion (if any) finally determined by OWNER after MECHANICAL COMPLETION of the LSTK-B Package. This Bank Guarantee (BG) 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 18 (Eighteen) months from the date of Mechanical completion or 12 (Twelve) months from date of Commissioning whichever is earlier.</p> <p>3. In case the Contractor submits a BG in lieu of "Price Adjustment for slippage incomplection" which has been deducted/ proposed to be deducted, the amount withheld / to be withheld on account of "Price Adjustment for slippage in completion" will be released/ will not be deducted.</p>	



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6.	Volume I, Commercial Section.	Part I: techno-commercial SCC 47.9	508 of 2784	<table border="1"> <thead> <tr> <th>Case</th> <th>Upward Price Variation beyond 31<sup>st</sup> Mar, 2021</th> <th>Negative Price variation beyond 31<sup>st</sup> Mar, 2021</th> </tr> </thead> <tbody> <tr> <td>No delay beyond CDD</td> <td>Indices shall be restricted to March 2021</td> <td rowspan="3">Actual indices of the month prior to two months in which steel is received at the project site and IMIR (Incoming material inspection report) is approved by PMC.</td> </tr> <tr> <td>Delay beyond CDD for reasons not attributable to Contractor &amp; approved extension upto 30<sup>th</sup> Sep 2021</td> <td>Indices shall be restricted upto two months prior to Sept, 2021, i.e. Jul 2021</td> </tr> <tr> <td>Delay beyond CDD upto 30<sup>th</sup></td> <td>Indices shall be</td> </tr> </tbody> </table>	Case	Upward Price Variation beyond 31 <sup>st</sup> Mar, 2021	Negative Price variation beyond 31 <sup>st</sup> Mar, 2021	No delay beyond CDD	Indices shall be restricted to March 2021	Actual indices of the month prior to two months in which steel is received at the project site and IMIR (Incoming material inspection report) is approved by PMC.	Delay beyond CDD for reasons not attributable to Contractor & approved extension upto 30 <sup>th</sup> Sep 2021	Indices shall be restricted upto two months prior to Sept, 2021, i.e. Jul 2021	Delay beyond CDD upto 30 <sup>th</sup>	Indices shall be	<p><b>Shall be read as</b></p> <table border="1"> <thead> <tr> <th>Case</th> <th>Upward Price Variation beyond 31<sup>st</sup> Mar, 2021</th> <th>Negative Price variation beyond 31<sup>st</sup> Mar, 2021</th> </tr> </thead> <tbody> <tr> <td>No delay beyond CDD</td> <td>Indices shall be restricted to March 2021</td> <td rowspan="2">Actual indices of the month prior to two months in which steel is received at the project site and IMIR (Incoming material</td> </tr> <tr> <td>Delay beyond CDD for reasons not attributable to Contractor</td> <td>Indices shall be restricted upto two months prior to Sept, 2021, i.e. Jul 2021</td> </tr> </tbody> </table>	Case	Upward Price Variation beyond 31 <sup>st</sup> Mar, 2021	Negative Price variation beyond 31 <sup>st</sup> Mar, 2021	No delay beyond CDD	Indices shall be restricted to March 2021	Actual indices of the month prior to two months in which steel is received at the project site and IMIR (Incoming material	Delay beyond CDD for reasons not attributable to Contractor	Indices shall be restricted upto two months prior to Sept, 2021, i.e. Jul 2021
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ONGC एम.आर.पी.एल. MRPL		MRPL Marketing Terminal Project at Devangonithi, Bangalore Marketing Infrastructure Projects, MRPL.				nauvata ENGINEERING CONSULTANTS			
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				Sep, 2018 for reasons attributable contractor	restricted to March 2018		& approved extension upto 30 <sup>th</sup> Sep 2021		inspection report) is approved by PMC.
							Delay beyond CDD upto <b>30<sup>th</sup> Sep, 2021</b> for reasons attributable contractor	Indices shall be restricted to <b>March 2021</b>	
7.	Volume I, Commercial Section.	Contract closing, Part A-3-10, Table of content, serial no-04	924 of 2784	FIMEFRAME FOR CONTRACT CLOSURE			<b>Shall be read as</b> "TIME FRAME FOR CONTRACT CLOSURE"		
8.	Volume I, Commercial Section.	Project execution philosophy, Part 01 Scc-09, Point No-02	673 of 2784	All storm water drains along with PCC covers are by civil contractor.			<b>Shall be read as</b> All storm water drains along with RCC precast covers are by civil contractor.		
9.	Volume I, Commercial Section.	Project execution philosophy, Part 01 Scc-09, Point No-03	673 of 2784	Tariff Advisor committed			<b>Shall be read as</b> Tariff Advisory Committee		
10.	Volume I, Commercial Section.	Project execution philosophy, Part 01 Scc-09, Point No-03	673 of 2784	The Contractor shall be provided with one piping terminal point near each building (within 2 m from building of suitable size; the details of piping terminal point such as			<b>Shall be read as</b> The Contractor shall be provided with one piping terminal point near each building		

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Sl. No.	Volume	Section No./Clause No.	Page No. as per document uploaded as Addendum-01	Existing Tender Clause	Addition / Deletion / Modification	
				pressure, water flow rate etc. shall be provided by Consultant during the contract stage)	(within 5 m from building of suitable size).The details of piping terminal point such as pressure, water flow rate etc. shall be provided by Consultant during the engineering stage).	
11.	Volume I, Commercial Section.	VENDOR LIST Sl.No 9.2		NEW DOCUMENT	<b>ADDITION DOCUMENT: 9.2.1</b> TENDER-B VENDOR LIST ATTACHED WITH ADDENDUM-02	
12.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: MASTER INDEX SL NO: 7 ANNEXURE TO SCC	3 OF 2784	ANNEXURE XIII: Contractor Worker Safety Policy	<b>SHALL BE READ AS:</b> ANNEXURE XIII: Circular issued by O/o Chief Engineer, CPWD, Bangalore for Base Price of Steel for January 2021 (for example/illustration purpose)	
13.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: MASTER INDEX SL NO: 7 ANNEXURE TO SCC	3 OF 2784	NEW ADDITION	<b>ADDITION:</b> Annexure –XIV: Snap Shot of All India Wholesale Monthly Price Index for MILD STEEL: LONG PRODUCTS released by Office of Economic Advisor to Government of India, Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry for the Month of January 2021(for Example/illustration purpose)	
14.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: MASTER INDEX SL NO: 7 ANNEXURE TO SCC	3 OF 2784	NEW ADDITION	<b>ADDITION:</b> ANNEXURE XV: Contractor Worker Safety Policy	







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Sl. No.	Volume	Section No./Clause No.	Page No. as per document uploaded as Addendum-01	Existing Tender Clause	Addition / Deletion / Modification	
15.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: SPECIAL CONDITIONS OF CONTRACT- ANNEXURE TO SCC	449 OF 2784	NEW ADDITION IN INDEX TO SCC	<b>ADDITION:</b> ANNEXURE XV: Contractor Worker Safety Policy	
16.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: MASTER INDEX SECTION D: DRAWINGS	9 OF 2784	NEW ADDITION FROM D.73. TO D.79.	<b>ADDITION: (D.73. TO D.78.)</b> 73. 20005-GEN-S-DW-2302-1: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 74. 20005-GEN-S-DW-2302-2: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 75. 20005-GEN-S-DW-2302-3: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 76. 20005-GEN-S-DW-2302-4: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 77. 20005-GEN-S-DW-2302-5: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 78. 20005-GEN-S-DW-2302-6: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details	
17.	Volume I, Commercial Section.	PART 1- TECHNO COMMERCIAL PART: MASTER INDEX VENDOR LIST, Sl. No: 9.2	3 of 2784	NEW ADDITIONS SL. NO: 9.2.1 & SL. NO: 9.2.2	<b>ADDITIONS:</b> 9.2.1: TENDER-B VENDOR LIST 9.2.2: MASTER SUPPLIER LIST	



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### Annexure-02: Technical Addendum



Sl. No.	Volume	Section No./Clause No.	Page No. as per document uploaded as Addendum-01	Existing Tender Clause	Addition / Deletion / Modification/ Clarification
1.	Vol 02 Technical part-01	Marketing Terminal Design Basis for Civil and Structural, Clause 2.0	1078 of 2784	2.0 SCOPE	This clause is deleted.  BIDDER shall refer the Package Scope of Works Vol2, Technical Part 1, Part C, Section C-1, Subsection C-1.1, Doc no: 20005-GEN-S-SOW-2014
2.	Vol 02 Technical part-01	Package Scope of work, SI No 156	1208 of 2784	CPWD / PWD Government of Karnataka.	<b>Shall be read as</b> CPWD / PWD Govt. of India/ Govt of Karnataka.
3.	Vol 02 Technical part-01	Package Scope of work, Section-C-1, Clause 10.15 "including gates"	1210 of 2784	New RCC framed compound wall (approx. length 900mtrs) including gates to a height of 4 Mtr with 750mm Dia concertina coil fence on top of compound wall and increase in height of existing compound wall (approx. length is 750mtrs) to the required height of 4 Mtr from the higher elevation of the site/top of plinth beam, with 750mm Dia concertina coil fence on top of compound wall). The modified compound wall height should match with the new	<b>Shall be read as</b>  New RCC framed compound wall (approx. length 900mtrs) to a height of 4 Mtr with 750mm Dia concertina coil fence on top of compound wall and increase in height of existing compound wall (approx. length is 750mtrs) to the required height of 4 Mtr from the higher elevation of the site/top of plinth beam, with 750mm Dia concertina coil fence on top of compound wall with 6 nos of gates. The modified compound wall height should match with the new compound wall height.  For numbers and location of the gates refer the Overall plot plan.



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				compound wall height		
4.	Vol 02 Technical part-01	Package Scope of work, Clause No 10.52	1211 of 2784	RCC Foundations for pipe, sleepers, other pipe supports, manifold, access platforms.	<b>Shall be read as</b> RCC Foundations for pipe, sleepers, other pipe supports, manifold, access platforms other foundation/ skid for vapor recovery unit, corrosion inhibitor skid, Antistadis/ Antioxidant, Trolley mounted meter prover system etc.	
5.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.11.8 (ff)	1217 of 2784	Structural steel column shall be connected with RCC foundation by providing anchor bolts embedded in the concrete.	<b>Shall be read as</b> "Structural steel column shall be connected with RCC foundation by foundation bolts embedded and grouted in the concrete."	
6.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.11.8.25	1226 of 2784	Pipe Rack / portals / local supports/ pipe sleepers / Platforms	<b>ADDITION of NEW Clause: 11.8.25.3</b> Structural pipe rack including RCC foundations for piping work from manifold to TLF gantry, pump houses and any other areas shall be provided by the CONTRACTOR. Necessary piping inputs shall be collected from OTHER CONTRACTORS through PMC.	
7.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.11.8.27.11	1227 of 2784	RCC Kerb wall shall be provided at sides of the roads (On side or both the side), near to the building entrance, green belt area, any other area as directed by PMC/OWNER. Prior approval shall be taken before start the construction.	<b>Shall be read as</b> "Kerb wall shall be provided with approved kerb stone, at sides of the roads (One side or both the sides), near to the building entrance, green belt area, any other area as directed by PMC/OWNER. Prior approval for the kerb stone shall be taken before start the job."	
8.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.11.8.27.13	1227 of 2784	The public village road (from watch tower -02 up to end of MRPL compound wall on east side passing through the TT parking area shall be reconstructed with 7mtrs wide RCC road and drain at both the side of the road	<b>Shall be read as</b> " The public village road (from watch tower -02 up to end of MRPL compound wall) on east side, passing through the TT parking area upto Coordinates N1437706.492, E807968.301 shall be reconstructed with 7mtrs wide plus 2 mtrs shoulder RCC road and drain at both the side of the road, covered with heavy duty precast RCC slabs."	

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				covered with heavy duty precast RCC slabs.		
9.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.11.8.27.14	1227 of 2784	The public village road (from watch tower -02 up to end of MRPL compound wall on south side shall be reconstructed with minimum 7mtrs wide RCC road and drain at both the side of the road covered with heavy duty precast RCC slabs.	The public village road from N1437522.435,E807854.410 to N1437525.157, E808024.566 on south side shall be reconstructed with minimum 7mtrs wide plus 2 mtrs shoulder RCC road and drain at both the side of the road covered with heavy duty precast RCC slabs.	
10.	Vol 02 Technical part-01	Package Scope of work, Scetion-C-1, clause No.12.2	1234 of 2784	NEW ADDITION	<b>ADDITION</b> <b>Clause 12.2.41</b> Design, Engineering, Supply, Installation, testing and commissioning of complete instrumentation related to package items like HVAC, OWS, STP, Raw Water Treatment Plant, Clean Agent system etc. as described above. Integration to DCS shall be in the scope of others, however contractor shall co-ordinate with other contractor through PMC and provide all details required for integration.  <b>Clause 12.2.42</b> All instrumentation works within the package unit which is to be supplied by CONTRACTOR like instruments, cables, tray, tray support, JB, Field Panel, Push Button Station, Package PLC etc. shall be part of CONTRACTOR scope of work. All Package instruments cable shall be terminated at final JB. Cables from Package item final JB to Control room shall be in scope of Others.	
11.	Vol 02 Technical part-01	DESCRIPTION OF SCOPE OF WORK FOR CIVIL & STRUCTURAL JOBS, Clause No. 11	1230 of 2784	NEW ADDITION	<b>ADDITION:</b> <b>11.8.33 RCC PITS FOR MS/HSD/SLOP TANKS</b> <ol style="list-style-type: none"> <li>RCC pit shall be provided for all the underground tanks (MS, HSD, SLOP) as per the approved drawings and specification.</li> <li>After excavation of the pit to the sufficient depth soil strata,</li> </ol>	

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					<p>ground water table etc. shall be examined thoroughly before detail engineering.</p> <p>iii. Depth of the pit shall be decided considering the dimension of the tanks and as per safety regulations.</p> <p>iv. Ground improvement shall be considered required if any.</p> <p>v. CONTRACTOR shall ensure that there should not be any void/ pocket bellow the tank foundation.</p> <p>vi. The excavation pit shall be filled with approved quality sand as per the specification. Sand filling to be done layer wise compacted by water / compactor as per the spec/ drawings.</p> <p>vii. Anti-corrosive layer shall be provided on surface of the RCC pit as per the specification.</p> <p>viii. The thickness of the PCC above sand filling shall be minimum of 100 mm as per the drawing and specification.</p> <p>Note: Placing the tank in the pit and installation is in the scope of OTHER CONTRACTOR. Inputs for foundation bolt / anchoring shall be obtained from OTHER CONTRACTOR through PMC</p>	
12.	Vol 02 Technical part-01	DESCRIPTION OF SCOPE OF WORK FOR CIVIL & STRUCTURAL JOBS, Clause No. 11	1227 of 2784	<b>NEW SUB CLAUSE UNDER CLAUSE NO: 11.8.27 RCC ROADS</b>	<p><b>Addition of new sub clause: 11.8.27.15 RCC Roads</b></p> <p>The RCC Road width as detailed in the overall plot plan is excluding shoulder width. Shoulder of 1M width shall be provided on the both sides of the road.</p> <p>Example:</p> <ol style="list-style-type: none"> <li>1) RCC Road width shown in plot plan is 5M + (1M+1M) shoulder on both sides. Hence total road width is 7M including shoulder width on both sides.</li> <li>2) RCC Road width shown in plot plan is 7M + (1M+1M) shoulder on both sides. Hence total road width is 9M including shoulder width on both sides.</li> </ol>	
13.	Vol 02 Technical	Specific requirement for	1258 of 2784	<b>NEW ADDITION</b>	False flooring shall be provided inside control room B2F2 to B6F6, UPS room and blast proof room. (Refer drawing 20005-GEN-S-DW-2301)	



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	part-01	construction and finishing work Serial No.-1.2.				
14.	Vol 02 Technical part-01	Engineering Design Basis for Structural & Architectural, C-2.1, Clause No. 02.	1284 of 2784	2.0 SCOPE	This clause is deleted.  BIDDER shall refer the Package Scope of Works Vol2, Technical Part 1, Part C, Section C-1, Subsection C-1.1, Doc no: 20005-GEN-S-SOW-2014	
15.	Vol-02 technical part-4	C-3.1 Specification for road construction. Clause No.9.2	2135 of 2784	<b>NEW ADDITION</b>	<b>New Clause</b> Grade of concrete shall be M30 instead of M25.	
16.	Vol 02 Technical part-01	Package Scope of work, Clause 10 Scope of work Civil, Structural and Architectural	1211 of 2784	NEW ADDITION	<b>NEW CLAUSE</b> <b>10.73</b> For external and internal finishing work contractor shall follow <b>"Specific requirement for construction and finishing work."</b> attached with this tender in Vol 2, Technical Part -01.	
17.	Vol-02 Part 06 (01)	Drawings	2435 of 2784	20005-GEN-L-DW-3001-REV0	REPLACED WITH REV 01 DRAWING NO: 20005-GEN-L-DW-3001-REV 01	
18.	Volume-02, Sl. No: A.2.1.	20005-GEN-G-DOC-9105 PLANNING, SCHEDULING AND MONITORING	874 of 2784	20005-GEN-G-DOC-9105-REV-0	REPLACED WITH REV 01 20005-GEN-G-DOC-9105 REV 01	
19.	Vol-02 Part 06 (01)	Drawings	2435 of 2784	20005-GEN-S-DW-2201 SHEET 1 of 2 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2201 SHEET 1 of 2 Rev-1	
20.	Vol-02 Part 06	Drawings	2448 of 2784	20005-GEN-S-DW-2214 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2214 Rev-1	

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	(01)					
21.	Vol-02 Part 06 (01)	Drawings	2455 of 2784	20005-GEN-S-DW-2303 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2303 Rev-1	
22.	Vol-02 Part 06 (01)	Drawings	2457 of 2784	20005-GEN-S-DW-2304 SHEET 2 of 3 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2304 SHEET 2 of 3 Rev-1	
23.	Vol-02 Part 06 (01)	Drawings	2458 of 2784	20005-GEN-S-DW-2304 SHEET 3 of 3 Rev 0	REPLACED WITH REV 01 20005-GEN-S-DW-2304 SHEET 3 of 3 Rev-1	
24.	Vol-02 Part 06 (01)	Drawings	2463 of 2784	20005-GEN-S-DW-2310 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2310 Rev-1	
25.	Vol-02 Part 06 (01)	Drawings	2465 of 2784	20005-GEN-S-DW-2312 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2312 Rev-1	
26.	Vol-02 Part 06 (01)	Drawings	2466 of 2784	20005-GEN-S-DW-2313 SHEET 1 of 2 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2313 SHEET 1 of 2 Rev-1	
27.	Vol-02 Part 06 (01)	Drawings	2471 of 2784	20005-GEN-S-DW-2326 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2326 Rev-1	
28.	Vol-02 Part 06 (01)	Drawings	2472 of 2784	20005-GEN-S-DW-2327 Rev-0	REPLACED WITH REV 01 20005-GEN-S-DW-2327 Rev-1	
29.	Vol-02 Part 06 (01)	Drawing	2450 of 2784	20005-GEN-S-DW-2301	False flooring shall be provided For Grid No B2F2 to B6F6, UPS room and blast proof room.	
30.	Vol-02 Part 06 (01)	Drawing 20005- GEN-S-DW-2206	2439 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing	<b>Shall be read as</b> Grade of RCC concrete for all the RCC grade slab / Rigid pavement shall be minimum.M-30.	

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				shall be used..	
31.	Vol-02 Part 06 (01)	Drawing 20005- GEN-S-DW-2401	2475 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
32.	Vol-02 Part 06 (01)	Drawing 20005- GEN-S-DW-2402	2480 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
33.	Vol-02 Part 06 (01)	Drawing 20005- GEN-S-DW-2403	2486 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
34.	Vol-02 Part 06 (02)	Drawing 20005- GEN-S-DW-2404	2489 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
35.	Vol-02 Part 06 (02)	Drawing 20005- GEN-S-DW-2405, 20005-GEN-S-DW- 2406, 20005-GEN- S-DW-2407, and 20005-GEN-S-DW- 2408.	2490-2497 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
36.	Vol-02 Part 06 (02)	Drawing 20005- GEN-S-DW-2410,	2499 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.
37.	Vol-02 Part 06 (02)	Drawing 20005- GEN-S-DW-2411,	2504 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete minimum grade of M30 for slab column pedestal/ footing shall be used.



		<b>MRPL Marketing Terminal Project at Devangonhi, Bangalore</b> <b>Marketing Infrastructure Projects, MRPL.</b>				
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38.	Vol-02 Part 06 (02)	Drawing 20005- GEN-S-DW-2412,	2509 of 2784	Point No-02 Concrete grade of M25 for slab column pedestal/ footing shall be used..	<b>Shall be read as</b> <b>Point No-02</b> Concrete grade of M30 (minimum) for slab column pedestal/ footing shall be used.	
39.	Vol-02 Part 06 (01 and 02)	Drawing			TYP grade slab details provided in the drawings are indicative only. RCC M30 grade (min) shall be provided for all the grade slab.	
40.	Vol-02 Part 06 (01 and 02)	Drawing			TYP grade slab details for buildings/ cabins provided in the drawings are indicative only, RCC grade slab shall be provided for all the buildings including ground floor.	
41.	Vol-02 Part 06	Drawing	-	NEW additions D.73. TO D.79.	<b>Additions: (D.73. TO D.78.)</b> Following drawings are added for indicative purpose 73. 20005-GEN-S-DW-2302-1: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 74. 20005-GEN-S-DW-2302-2: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 75. 20005-GEN-S-DW-2302-3: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 76. 20005-GEN-S-DW-2302-4: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 77. 20005-GEN-S-DW-2302-5: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details 78. 20005-GEN-S-DW-2302-6: Typical Admin, Amenity & Control Building, Schematic Plan and Typical RCC Details	

<b><u>GENERAL NOTES/ INSTRUCTIONS</u></b>	
1	ONLY 'FIRST' QUALITY MATERIALS SHALL BE USED.
2	PMC/OWNER RESERVE THE RIGHT TO CHOOSE ANY OF THE APPROVED PRODUCT/ BRAND/ MANUFACTURER AS PER THIS LIST
3	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
4	DOSAGE OF ADMIXTURES, WHEREVER NOT MENTIONED IN THIS LIST, SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
5	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
6	CONTRACTOR MAY PROCURE MATERIAL FROM ANY OF THE LISTED VENDORS FROM THE TENDER-B VENDOR LIST. HOWEVER WORKLOAD, STABILITY AND SOLVENCY OF THE VENDORS NEED TO BE VERIFIED BY THE CONTRACTOR BEFORE PLACEMENT OF ORDER
7	CONTRACTOR SHALL NECESSARILY PROCURE ALL THE MATERIAL / EQUIPMENT FORMING PERMANENT PART OF THE UNIT / PLANT FROM THIS TENDER-B VENDORS LIST ONLY. THIS SHALL INCLUDE SUB-ORDERED ITEMS / COMPONENTS ALSO. THE "APPROVED VENDORS" IN THIS TENDER-B VENDOR LIST SHALL BE ITEM SPECIFIC
8	FOR ITEMS NOT COVERED IN THE TENDER-B VENDOR LIST, THE CONTRACTOR SHALL REFER TO THE MASTER SUPPLIER LIST ATTACHED WITH THE TENDER DOCUMENT. FOR SUCH ITEMS, VENDORS SHALL BE APPROVED BY PMC PRIOR TO PLACEMENT OF ORDER BY CONTRACTOR. CONTRACTOR SHALL LIST DOWN THE PROPOSED SUPPLIERS / VENDORS FOR SUCH ITEMS AND SUBMIT THE SAME FOR PMC'S REVIEW AND APPROVAL
9	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
10	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

**TENDER-B VENDOR LIST**

11	FOR ITEMS NOT COVERED IN THE TENDER-B VENDOR LIST AND MASTER SUPPLIER LIST, 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
12	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
13	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
14	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 TENDER-B VENDOR LIST ENCLOSED HEREWITH.
15	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
16	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 TO LSTK 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
17	THE PRECEDENCE OF VENDOR LIST SHALL BE AS FOLLOWS IN THE DESCENDING ORDER OF PRECEDENCE
17.1	TENDER-B VENDOR LIST
17.2	MASTER SUPPLIER LIST

**ELECTRICAL**

SL NO.	ITEM DESCRIPTION	APPROVED MAKES / BRAND/VENDOR
1	LV MOTORS	CGL/ KIRLOSKAR/ BHARATH BIJLEE/ ANSALDO (NIDEC)/ SIEMENS/ MARATHON/ FUJI/ TOSHIBA/ ABB/ JEUMONT/ HYUNDAI/ CEMP/ HITACHI
2	HV MOTORS	CGL/ BHARATH BIJLEE/ ANSALDO (NIDEC)/ SIEMENS/ MARATHON/ FUJI/ TOSHIBA/ ABB/ JEUMONT/ HYUNDAI/ CEMP/ HITACHI
3	LIGHTNING ARRESTOR	OBLUM / LAMCO / CGL / AREVA / SIEMENS/ABB
4	HT SWITCHGEAR	SIEMENS/ SCHNEIDER/ ABB/ JYOTHI/ L&T
5	DISTRIBUTION TRANSFORMER (OIL IMMERSSED)	VOLTAMP / CGL / BHARAT BIJLEE / KIRLOSKAR ELECTRIC COMPANY / EMCO / BHEL / GE / ABB/ AREVA.
6	DISTRIBUTION TRANSFORMER (DRY TYPE)	KIRLOSKAR/ ABB/ BHEL/ VOLTAMP/ RAYCHEM RPG.
7	LIGHTING TRANSFORMER (DRY TYPE)	BEBLEC/ CHHABBI/ AUTOMATIC ELECTRIC/ VOLTAMP/ RAYCHEM RPG
8	BATTERIES (NI CD)	AMCO-SAFT / HBL-NIFE
9	BATTERY CHARGER	CHABBI ELECTRICALS / HBL-NIFE / AUTOMATIC ELECTRIC / CALDYNE / UNIVERSAL / AMARARAJA / DUBAS / CALDYNE / MASSTECH / KELTRON / CHLORIDE POWER SYSTEMS / AUTOMATIC ELECTRIC
10	LT SWITH BOARDS.	L & T / SIEMENS / SCHNEIDER / ABB / GE.
11	LDB / SDB / ACDB / PDB (LIGHTING).	LEGRAND / INDO ASIAN / L&T / SIEMENS / HAVELS
12	VARIABLE FREQUENCY DRIVES	ABB / SIEMENS / L&T (YASKAVA) / SCHNEIDER //DANFOSS / ROCKWELL / KIRLOSKAR/ VACON.
13	HT CABLES	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/ TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ CCI
14	LT POWER CABLES	KEC INTERNATIONAL / KEI INTERNATIONAL / POLYCAB / TORRENT / UNIVERSAL / NICCO / RADIANT / RR KABLE / CHORDS / GEMS CABLE/ CCI / LAPP
15	LT CONTROL CABLES	KEC INTERNATIONAL / KEI INTERNATIONAL / POLYCAB / TORRENT / UNIVERSAL / NICCO / RADIANT / RR KABLE / CHORDS / GEMS CABLE/ CCI / LAPP
16	HEAT TRACER	RAYCHEM / THERMON / CHROMOLOX / BARTECH / XICON
17	NON FLP LIGHTING FIXTURES	PHILIPS / CGL / BAJAJ / GE / OSRAM / SURYA ROSHINI/ HAVELLS / WIPRO

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18	FLAMEPROOF EQUIPMENT	BALIGA / EX-PROTECTA / FCG / FLEXPPO / SUDHIR / FLAMEPACK / COOPER CROUSE HINDS/ GOVAN INDUSTRIES
19	HIGH MAST	BAJAJ / CGL / PHILIPS / WIPRO
20	TERMINATION KIT & STRAIGHT THROUGH JOINTS	RAYCHEM / 3M
21	NUMERICAL RELAYS	SCHNEIDER/ SIEMENS/ ABB/ SEL/ GE/ALSTOM
22	PROTECTIVE RELAYS/ AUXILIARY RELAYS & SEMAPHORES	SIEMENS / SCHNEIDER / ABB / GE / SEL / ALSTOM
23	INSTRUMENT TRANSFORMERS /CURRENT TRANSFORMERS	KALPA / KAPPA / PRAGATI / ECS / JYOTHI
24	INDICATING / RECORDING METERS	AUTOMATIC ELECTRIC / MECO / RISHAB / ELSTER/ L & T / ENERCON/SCHNEIDER
25	CONTROL SELECTOR SWITCHES/ PUSH BUTTONS	KAYCEE / SWITRON / RECON/ AREVA / SALZER/ SIEMENS / TEKNIC / L & T / BCH / VAISHNOV/GE
26	AUXILIARY CONTACTORS TIMERS	SIEMENS / L&T / TC / ABB / GE / BCH / TELEMECHANIQUE
27	CONTACTORS	ABB / GE / SIEMENS / L&T / SCHNEIDER
28	CABLE TRAY	PATNY & CO / TECHNOFAB / INDIANA / SADHANA
29	CABLE GLANDS	SMI / COMET / MAYUR / JANSON
30	CABLE LUGS / SOCKETS / FERRULES / CAGE CLAMP TERMINALS	DOWELLS / CONNECT WEL / ISMAL / WAGO/ ELEMEX
31	MCB / ELCB / RCCB	L&T / SCHNEIDER / ABB / SIEMENS / GE / HAVELS / LEGRAND / HAGER / ELSTER / MERLIN GERIN/ S&S / INDO ASIAN
32	FUSE	L&T / SCHNEIDER / ABB / SIEMENS / GE / HAVELLS / LEGRAND / COOPER BUSSMAN
33	SFU	GE / L&T / SCHNEIDER / SIEMENS / ABB
34	ACB	ABB / L&T / GE / SCHNEIDER / SIEMENS
35	MCCB	L&T / GE / SCHNEIDER / SIEMENS / LEGRAND/ABB/HAGER
36	G. I. PIPE	TATA / JINDAL / APOLLO / ZENITH
37	MS / GI CONDUITS	J.K.TUBE / BEC / APOLLO
38	COPPER WIRES FOR WIRING ( LIGHTING/POWER)	FINOLEX / POLYCAB / RR KABLE/ LAPP KABLE/ V GUARD/ HAVELLS
39	PVC CONDUITS AND PVC CASING 'N' CAPPING	AVON PLAST / MODI / UNIVERSAL / PRECISION
40	DECORATIVE SWITCHES & SOCKETS	ANCHOR / CRABTREE/ HAVELLS/ MK ELECTRIC
41	POWER PLUG & SOCKET (INDUSTRIAL TYPE)	CROMPTON GREAVES / BEST& CROMPTON / EE / GEC / BCH
42	INDICATING LAMPS	L&T / SCHNEIDER / SIEMENS / KEYCEE / PRECIFINE / TECHNIC/ BCH / VAISHNO / ESSEN
43	SOLID STATE ANNUNCIATOR	L&T / PROCON / INSTALLARM / MINILEC
44	STREET LIGHTING POLES	RAJAN / KL INDUSTRIES / SHUBHAM

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45	MODULAR SWITCHES & SOCKETS WITH COVER PLATES 5 A /15 A	LEGRAND (ARTEOR)/ ANCHOR (ROMA)/ CRABTREE (THAMES/ATHENA)/ NORTH-WEST (PLATIA/NOWA/STYLUS)/ ABB (CONCEPT/CLASSIQ)
46	MODULAR TYPE TELEPHONE (RJ-11) / DATA (RJ-45) / TELEVISION COAXIAL CABLE OUTLETS	LEGRAND (ARTEOR/ ANCHOR (ROMA)/ CRABTREE (THAMES/ATHENA)/ NORTH-WEST (PLATIA/NOWA/STYLUS)/ ABB (CONCEPT/CLASSIQ)
47	PVC SURFACE-MOUNTED BOXES & METAL FLUSH-MOUNTED GANG BOXES	LEGRAND/ ANCHOR/ CRABTREE/ NORTH-WEST/ ABB
48	METAL-CLAD PLUG SOCKETS & TOPS	LEGRAND/ HAGER/ SIEMENS/ SCHNEIDER/
49	PVC INSULATED – STRANDED COPPER CONDUCTOR WIRES	POLYCAB/ FINOLEX/ KEI/ RR CABLES/ DELTON/ UNIFLEX
50	PVC INSULATED TELEPHONE WIRES WITH TINNED COPPER CONDUCTORS	POLYCAB/ FINOLEX/ KEI/ RR CABLES/ DELTON
51	CAT-6 LAN (UTP/STP) CABLES	MOLEX/ DELTON/ RR CABLES/ BELDEN
52	PVC/XLPE INSULATED – ARMoured LT/MV POWER CABLES	POLYCAB/ KEI/ UNIVERSAL/ CORDS & CABLES INDIA/
53	POLYCARBONATE ENCLOSURES FOR LIGHTING / POWER DISTRIBUTION BOARDS	LEGRAND/ HAGER/ HENSEL/ RITTAL
54	LED LIGHT FIXTURES	PHILIPS/ BAJAJ/ CROMPTON GREAVES/ GE LIGHTING/ WIPRO
55	ROOM OCCUPANCY SENSORS / ACCESSORIES	ABB/ WIPRO/ PHILIPS/ GE LIGHTING/ SIEMENS
56	GI PERFORATED CABLE TRAYS & ACCESSORIES	INDIANA/ PROFAB/ ADITYA STEEL INDUSTRIES/ PATNY SYSTEMS/ VATCO ELEC POWER
57	GI RACEWAYS & JUNCTION-BOXES	INDIANA/ PROFAB/ ADITYA STEEL INDUSTRIES/ PATNY SYSTEMS
58	FRP PERFORATED CABLE TRAYS	GENERAL COMPOSITE/ SINTEX/ SUMIP COMPOSITES/ KEMROCK
59	GI CONDUITS FOR WIRES	VATCO ELEC-POWER/ SPARK ELECTRODES/ GI PIPES INDIA/ GB CONDUIT PIPES MFG.
60	HEAVY DUTY PVC CONDUITS FOR WIRES	FINOLEX/ SINTEX/ NIJANAND PIPES & FITTINGS/ SANCO INDUSTRIES
61	GI EARTH STRIPS & ELECTRODES	GRAVIN EARTHING/ VATCO ELECT POWER/ AMTECH POWER ENGINEERING/ AERON EARTHING/ SPARK ELECTRODES
62	CABLE GLANDS-WEATHER-PROOF/FLAME-PROOF	COSMOS/ COMET/ AXIS ELECTRICALS/ PHOENIX CONTACTS/ CONTROLWELL
63	CABLE LUGS & FERRULES-CRIMPING TYPE	DOWELLS/ AXIS ELECTRICALS/ COMET/ PHOENIX CONTACTS
64	HEAT SHRINKABLE TYPE LT / MV CABLE JOINTS	HEAT-SHRINK/ 3M/ RAYCHEM/YAMUNA

**TENDER - B VENDOR LIST**

65	FIRE ALARM SYSTEM & COMPONENTS	HONEYWELL AUTOMATION/ SIEMENS BUILDING TECHNOLOGIES/ EDWARDS-UNITED TECHNOLOGIES CORP/ KIDDE FIRE SYSTEMS
66	AIR-CONDITIONING UNITS - SPLIT/ CASSETTE TYPE	CARRIER/ BLUESTAR/ VOLTAS/ LLOYD/ HITACHI/ DAIKIN/ PANASONIC/ MITSUBUSHI/ LG/ SAMSUNG
67	POWER DISTRIBUTION SWITCHBOARDS FOR PACKAGES –FIXED TYPE #	M.K. ENGINEERS & CONTROLS/ ZENITH ENGINEERING CORPORATION/ POPULAR SWITCHGEARS/ VIDHYUT CONTROL (INDIA) PVT. LTD. POWER & CONTROL EQUIPMENTS/ POSITRONICS PVT. LTD./SYSTEM INTEGRATOR OF ABB/SCHNIEDER/SIEMENS/L&T/GE/ # ANY PANEL BUILDER WITH SWITCHBOARD TYPE TESTED BY CPRI WITH COMPONENTS FROM THE LIST ABOVE. THE TYPE TEST REPORT SHALL NOT BE OLDER THAN 5 YEARS FROM THE DATE OF PO

**MECHANICAL**

SL NO.	ITEM DESCRIPTION	APPROVED MAKES / BRAND/VENDOR
1	SEAMLESSPIPES	1. MAHARASHTRA SEAMLESSLTD
		2. INDIAN SEAMLESS METAL TUBESLTD.
		3. BHEL
		4. RATHNAMANI
		5. SAW PIPES LIMITED (SEAMLESSDIVISION)
2	PIPEFITTINGS	1. ADITYA FORGE LTD.BORODA.
		2. ALLIANCE FITTINGS &FORGINGS LTD.MUMBAI.
		3. SHIVANANDA PIPE FITTINGS LTD.CHENNAI.
		4. STEWARTS & LLOYDS OF INDIA LTD.CALCUTTA
		5. NL HAZRA &SONS/CALCUTTA.
		6. TEEKAY TUBES PVT. LTD.MUMBAI.
3	CENTRIFUGALPUMPS	1. FLOWSERVE PUMPSLTD.
		2. KIRLOSKAR EBARALTD.
		3. KSB PUMPSLTD.
		4. SAM TURBO INDUSTRIESLTD.
		5. SULZER PUMPSLTD.
		6. KIRLOSKAR BROTHERSLTD.
4	DOSING / METERINGPUMPS	1. SWELORE ENGINEERING PVT. LTD.MUMBAI.
		2. ASIA-LMI PVT. LTD/CHENNAI.
		3. SHAPOTOOLS/MUMBAI.
		4. ALWEYN PUMPS & SYSTEMS LTD.MUMBAI.
5	GATE/ GLOBE AND CHECK VALVES/ PRESSURE RELIEFVALVES	1. AUDCO INDIALTD.
		2. BDK ENGINEERING INDUSTRIESLTD.
		3. ECONO VALVES PVT.LTD.
		4. FOURESS ENGINEERING (I)LTD.
		5. STEAM &MININGIND.
		6. KSB PUMPSLTD.
		7. STEEL STRONG VALVES (I) PVT.LTD.
		8. BHELLTD.
6	BALLVALVES	1. AUDCO INDIALTD.
		2. MICROFINISH VALVESLTD.
		3. ALPHA LEVEL SANNDERSLTD.
		4. KSB PUMPSLTD.
		5. VIRGO ENGINEERSLTD.
		6. STEEL STRONG VALVES (I) PVT.LTD.
7	STRAINERS	STEEL STRONG
		LIQUID CONTROLS
		BROOKS
		BOPP & REUTHER
		SMITH
		TELTECH
8	TSVS	KEY STONE
		SEBIM INDIA
		FAINGER LESER



**TENDER - B VENDOR LIST**

		TYCO SANMAR
9	MICRON & COALESCERFILTERS	1. MULTITEX
		2. FACET
		3. GLOBEHI-FAB
10	AUTO-RECIRCULATIONVALVES	1. SCHROEDEHL
		2. YARWAY
		3. HORA
11	PRESSURE VACUUM RELIEFVALVES	1. PENTATECH
		2. NIRMAL
		3. TELTECH
12	PUMP SEALS(MECHANICAL)	1. DURAMETALLIC
		2. EPIL
		3. BURGMANN
		4. FLOWSERVE
13	WELDINGELECTRODE	1. ADORE
		2. ESAB
		3. PHILLIPS
		4. D AND HSECHRON
		5. HANAVAR
		6. MAILAM
		7. GEE

**STRUCTURAL**

SL NO.	ITEM DESCRIPTION	APPROVED MAKES / BRAND/VENDOR
1	STRUCTURALSTEEL	1. SAIL
		2. RINL
		3. TISCO
		4. JINDAL
2	ELECTRODES	1. ESSAB
		2. GEE
		3. ADOR (ADVANIORLIKON)
		4. D&H(INDIA)
		5. D & H(SECHERON)
3	PAINT	1. BERGERPAINTS
		2. SHALIMARPAINTS/
		3. AKZO-NOBELCOATINGS/
		4. SIGMACOATING/
		5. ASIANPAINTS/
		6. GRAUER & WEIL (INDIA)LIMITED.
4	PRE-COLOUR COATED SHEET AND TRANSLUCENT FRP SHEETS	1. CRIL (COLOUR ROOF INDIALIMITED)
		2. TATA BLUESCOPE/
		3. LLOYD INSULATION (I)LTD/
		4. INTERARCH
		5. SIMBA FRP PVT LTD

**FIRE WATER SYSTEM**

SL NO	ITEM DESCRIPTION	APPROVED MAKES/BRANDS/VENDORS
1	GATE AND NRV (CARBON STEEL)	FOURESS/ AUDCO/ KIRLOSKAR BROTHERS/ KSB/ CRESCENT VALVES/ BDK/ INDIAN VALVE(IVC)/ L&T/ NECO/ AV VALVES/ XOMOS/ LEADER/ KBL/ BHEL/ FLUID CONTROL EQUIPMENT/ STEAM & MINING/ VIRGO
2	GATE AND NRV (CL)	KIRLOSKAR BROTHERS/ STEAM & MINING/ IVPL/ AV VALVES/SHIV DURGA/ BDK/ FOURESS.
3	BUTTERFLY VALVES	AUDCO/ FOURESS/ INDIAN VALVE/ L&T/ FISCHER/ XOMOS/ TYCO VALVES/ JASH/ AVC ENGG/ FLEX/ KIRLOSKAR BROTHERS/ VIRGO/ AL SAUNDERS/ STEAM & MINING/ KEYSTONE/ BDK/ IVPL NASIK
4	GUNMETAL GATE/ GLOBE/ CHECK VALVE	BOMBAY METAL/ LEADER/ LEVCON VALVES/ NETA/ SANT/ ZOLOTO/ KEYSTONE/ SAMSONS
5	AIR RELEASE VALVE	SHIVA DURGA/ IVPL/ IM ENGINEERS/ STEAM & MINING/ SCHRODER DUNCUM/ FLUID LINE VALVES.
6	BALL VALVE	AUDCO/ KSB/ AL SAUNDERS/ XOMOX/ VIRGO/ BDK/ VIRGO
7	SOLENOID VALVES	SIETS ROTEX/ NORGRN/ SCHRADER/ AVCON/ BS/ REXROTH/ SICMAG/ SCHARDER/ NECO/ INFOS/ EASTERN PNEUMATIC/ BLUESTAR/ AVCON/ ASCO
8	STRAINER	OTOKLIN/ SUPERFLO/ TRIVENI/ SAROJINI ENTERPRISES/ FILTRATION ENGINEERS / BOLL&KIRCH/ IMETROL/ JPG/ PLENTY/ FILTER MFG. IND./ PUROLATOR
9	DELUGE VALVES	KIDDE INDIA/ GRINELL / TYCO/ HD FIRE
10	WATER SPRAY NOZZLES	RELIABLE/ ASCO/ HD FIRE/ LAXMI SPRINKLER/ GRINELL / TYCO/ FIRE TECH
11	Q.B. DETECTOR	RELIABLE/ ASCO/ HD FIRE/ GRINELL / TYCO
12	PORTABLE FIRE EXTINGUISHERS	VIPL / KIDDE INDIA/ STEELAGE/GUNNEBO/ MINIMAX/ ZENITH/KOOVERJI DEVSHI/ SAFEX/ NEW FIRE/ ACE FIRE
13	STEEL PIPES (MS)	SAIL/ ITC/ BST. JINDAL/ AJANTA/ PRAKASH TUBES/ ZENITH/ GUJRAT STEEL TUBES/ TATA/ MAHARAstra SEAMLESS/ KALINGA/ SURYA/ RSP/ PSL/ RINL/ RATNAMANI/ IISCO/ SAW
14	STEEL PIPE FITTINGS	TUBE BENDS/ GUJRAT INFRA PIPES/ MS FITTINGS/ TUBE PRODUCTS/ EBY INDUSTRIES/ STEWARDS&LLOYDS/ HEAVY METAL TUBES/ NOBEL TUBES/ RAJENDRA MECH. IND./ VITRAG/POONAM ENTERPRICES/ N.L HAZRA/ VEKETESHUDYOG/ NAVKAR/ RELIABLE STEEL (RELIABLE PIPES & TUBESLIMITED)
15	WATER / FOAM MONITOR	NEWAGE/ HD FIRE/ FM/UL LISTED
16	FIRE HYDRANT	NEW AGE INDUSTRIES/ STRUMECH/ FIRETECH
17	FIRE HOSE	NEW AGE INDUSTRIES/ STRUMECH/ FIRETECH/ STEELAGE
18	FOAM SYSTEM EQUIPMENTS	HD FIRE/ NEW AGE INDUSTRIES/ FIRE TECH
19	FOAM CONCENTRATE	NEWAGE/ KV FIRE CHEMICALS/ INTEGRATED FIRE PROTECTION
20	RCC PIPES & FITTINGS	SUR INDUSTRIAL PIPES/ HIND CERAMICS/ INDIAN HUME PIPES/ DAYA CUNCRCHING.

**TENDER-B VENDOR LIST**

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<b>WATER SUPPLY SYSTEM</b>		
<b>SL NO</b>	<b>ITEM DESCRIPTION</b>	<b>APPROVED MAKES/BRANDS/VENDORS</b>
1	GATE AND NRV (CARBON STEEL)	FOURESS/ AUDCO/ KIRLOSKAR BROTHERS/ KSB/ CRESCENT VALVES/ BDK/ INDIAN VALVE(IVC)/ L&T/ NECO/ AV VALVES/ XOMOS/ LEADER/ KBL/ BHEL/ FLUID CONTROL EQUIPMENT/ STEAM &MINING/ VIRGO
2	GATE AND NRV (CL)	KIRLOSKAR BROTHERS/ STEAM & MINING/ IVPL/ AV VALVES/ SHIV DURGA/ BDK/ FOURESS.
3	BUTTERFLY VALVES	AUDCO/ FOURESS/ INDIAN VALVE/ L&T/ FISCHER/ XOMOS/ TYCO VALVES/ JASH/ AVC ENGG/ FLEX/ KIRLOSKAR BROTHERS/ VIRGO/ AL SAUNDERS/ STEAM &MINING/ KEYSTONE/ BDK/ IVPL NASIK
4	GUNMETAL GATE/ GLOBE/ CHECK VALVE	BOMBAY METAL/ LEADER/ LEVCON VALVES/ NETA/ SANT/ ZOLOTO/ KEYSTONE/ SAMSONS
5	AIR RELEASE VALVE	SHIVA DURGA/ IVPL/ IM ENGINEERS/ STEAM & MINING/ SCHRODER DUNCUM/ FLUID LINE VALVES.
6	BALL VALVE	AUDCO/ KSB/ AL SAUNDERS/ XOMOX/ VIRGO/ BDK/ VIRGO
7	STRAINER	OTOKLIN/ SUPERFLO/ TRIVENI/ SAROJINI ENTERPRISES/ FILTRATION ENGINEERS / BOLL&KIRCH/ IMETROL/ JPG/ PLENTY/ FILTER MFG. IND./ PUROLATOR
8	STEEL PIPES (MS)	SAIL/ ITC/ BST. JINDAL/ AJANTA/ PRAKASH TUBES/ ZENITH/ GUJRAT STEEL TUBES/ TATA/ MAHARASTRA SEAMLESS/ KALINGA/ SURYA/ RSP/ PSL/ RINL/ RATNAMANI/ IISCO/ SAW
9	STEEL PIPE FITTINGS	TUBE BENDS/ GUJRAT INFRA PIPES/ MS FITTINGS/ TUBE PRODUCTS/ EBY INDUSTRIES/ STEWARDS&LLOYDS/ HEAVY METAL TUBES/ NOBEL TUBES/ RAJENDRA MECH. IND./ VITRAG/ POONAM ENTERPRICES/ N.L HAZRA/ VEKETESH UDYOG/ NAVKAR/RELIABLE STEEL (RELIABLE PIPES &TUBES LIMITED)
10	RCC PIPES & FITTINGS	SUR INDUSTRIAL PIPES/ HIND CERAMICS/ INDIAN HUME PIPES/ DAYA

**HVAC**

SL NO.	SYSTEM	APPROVED MAKES/BRANDS/VENDORS
1	AIR CONDITIONING SYSTEM	VOLTAS/BLUESTAR/EMERSON/VERTIV
2	REFRIGERANT PIPES	NIPPON / MANDEV
3	INSULATION	K-FLEX / AEROFLEX / ARMAFLEX / THERMO BREAK / LLOYDS / PARAMOUNT
4	FILTERS	AEROSAL / THERMODYNE / DYNA / JOHN FOWLER
5	CNC MADE DUCT	ROLASTAR / CAMDUCT / DUCTMASTER / WESTERN AIR DUCTS / ZECO
6	DIFFUSERS / VCDS DAMPERS / FIRE DAMPERS	RAVISTAR / CARYAIRE / SYSTEM AIR / AIR MASTER
7	ELECTRIC DAMPERS ACTUATORS FOR MOTORIZED	BELIMO / SIEMENS / HONEYWELL
9	TA FANS	KHAITAN / KRUGER / ALMONARD / CROMPTON / GEC / NADI
1	3-WAY MODULATING VALVE	DANFOSS/ HONEYWELL/ JOHNSON CONTROLS/ PSL LTD/ SIEMENS
2	AHU	BLUESTAR/ CARYAIRE/ EDGETECH/ SUVIDHA (SAVEAIR)/ VOLTAS/ ZECO
3	AIR FILTERS	AIRTECH/ ANFILCO/ DYNA/ TENACITY/ THERMADYNE
4	BREARINGS/PLUMMER BLOCK	FAG/ NBC/ NTN/ SKF/ TIMKEN
5	CENT. FAN FOR HVAC APPLICATION	ADVANCE VENTILATION/ AIR CONTROL & CHEMICAL ENGG CO. LTD./ FLAKT (INDIA)LTD./ KRIGER/ NICOTRA/ S.K. SYSTEM
6	CHILLER PKG/CONDENSING UNIT	BLUESTAR/ CARRIER/ DAIKIN/ HITACHI/ LG/ TRANE/ KIRLOSKAR/ VOLTAS/ YORK
7	COALESCER PACK/ELEMENT	ACS/ CLARK RELIANCE (FOR GAS APPLICATION)/ FILTAN/ JONELL/ PALL FILTERITE/ PARKER HANNIFIN/ PECO FACET/ PEERLESS
8	DAMPER ACTUATOR	BELCO/ DANFOSS/ HONEYWELL/ SIEMENS
9	EXHAUST FAN (AXIAL FAN)	ALSTOM/ CROMPTON/ PATEL AIRFLOW LTD.
10	FILTER CATRIDGES	CLARK RELIANCE (GAS APPLICATION)/ DOLLINGER/ JONELL/ PALL FILETERITE/ PARKER HANNIFIN/ PECO-FACET/ PEERLESS
11	FIRE DAMPERS	CARYIRE/ GEORGE RAO & CO/ RAVISTAR/ TSC INSTRUMENTS
12	G.I. SHEET	JINDAL/ SAIL/ TATA /JSW
13	GAS CYLINDERS	AJAY AIR PRODUCT (P) LTD./ BOC INDIA/ DELUX INDUSTRIAL GASES/ SIGMA GASES & SERIES/ SRI VENKATESWARA CARBONIC GASES
14	GRILL/DIFFUSER	AIR MASTER/ CARRYAIRE/ DYNACRAFT/ RAVISTAR
15	MODULATING MOTOR WITH PROP. THERMOSTAT	HONEYWELL/ INDFOSS/ JHONSON CONTROLS/ PENN/ SIEMENS
16	POROUS METAL CATRIDGES	FUJI/ MOTT/ PALL/ PORAL
17	SPLIT / CASSETTE TYPE AC	BLUE STAR/ CARRIER/ DAIKIN/ HITACHI/ LG/LLOYDS/ MITSHUBISHI/ PANASONIC/ VOLTAS

## TENDER-B VENDOR LIST

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18	V-PULLEYS & V-BELTS	DUNLOP/ FENNER
19	VOL.CONTROL DAMPERS/LOUVERS FOR AC SYSTEM	ADVANCE VENTILATION/ AIR MASTER/ CARRYAIRE/ DYNACRAFT/RAVISTAR/ S.K SYSTEMS

**TENDER-B VENDOR LIST**

<b>CIVIL &amp; ARCHITECTURAL</b>		
<b>SL.NO</b>	<b>DESCRIPTION</b>	<b>APPROVED MAKES/VENDORS/BRANDS</b>
1	GLAZED TILES / CERAMIC TILES / VITRIFIED CERAMIC TILES	HR JOHNSON/ KAJARIA TILES/ SOMANY/BELL-CERAMICS/ NITCO/ MURUDESHWAR CERAMICS LTD.
2	METALLIC FLOOR : HARDENR	TRIVENI COLOR INDUSTRIES (FLOORNATE)/ HEATLY& GRESHAM (INDIA) LTD/ DE-RUST CHEMICAL CORPORATION OF INIDA (FERRONITE)/ CEMENT RESEARCH CORPORATION PVT.LTD.(STILONITE)/CHOKSEY CHEMICALS/CICO TECHNOLOGIES/SAMROCK CHEMICALS
3	EPOXY COATING FOR FLOORING	BASF/BUILDTECH/CICO /CIPY PU/FOSROC/PIDILITE/SIKA/STANVAC
4	STEEL DOORS/ ROLLING SHUTTERS & PRESS STEEL DOOR FRAMES	SHAKTHI MET-DOOR/ MADHUINDUSTRIES/ SENHARVIC/ AGEW/ DECCAN STRUCTURAL SYSTEMS PVT. LTD./ BASIC ARCH. PRODUCTS (PUNE)/ NCLSECCOLOR LTD./ PERFECT INDUSTRIAL PRODUCTS /DHIMAN STEEL/SKS STEEL/ SUPER STEEL
5	FIRE RATED DOORS	NAVAIR INTERNATIONAL/MPP TECHNOLOGIES/SUPER STEEL WINDOWS
6	ALUMINIUM DOORS/ WINDOWS/ CURTAIN WALLS / STRUCTURAL GLAZING SECTIONS	INDAL / BHORUKA/ HINDALCO/ JINDAL
7	GLASS :(PLAIN/FROSTED CLEAR / TINTED FLOAT GLASS)	MODIGAURD/ SAINT-GOBAIN/ ASAHI/ HINDUSTHAN SAFETY GLASS WORKSLTD
8	HARDWARE FITTINGS & FIXTURES:	JAYANT METAL MANUFACTURING CO./ SHALIMAR HARDWARE/ EVERITE/ HARDWYN/ EARL BIHARI/ GODREJ & BOYCE/ SECUR INDUSTRIES / EBCO / CROWN / DORMA
9	WATERSTOPS: (PVC/RUBBER)	OMAI PLASTICS (P) LTD. BASECON/ PASK/ ASIANENGG. PRODUCTS/ RC ENTERPRISES/ CAPNHANSINDIA LTD/ FIXOPANENGRS. PVT. LTD.
10	EXPANSION JOINT AND TARFELT WATERPROOFING	SHALITEX/ TIKI TAR INDUSTRIES/ STP LTD. (MS SHALIMAR TAR PRODUCTS)/ LLOYD INSULATION (I)/ PIDILITE/ IWL
11	INTEGRAL WATER PROOFING COMPOUND	ACCOPROOF/ CICO/ IMPERMOLAFARGE/ FOSROC/ROFFE/SIKA/BASF
12	WATERPROOFING TREATMENT, APP MEMBRANE	SIKA/ FOSROC/ ROFFE/ OVERSEAS WATER PROOFING CORPORATION/ CHOWGULE /TEXSA/ PIDILITE/FOSROC/SIKKA/BASF
13	CEMENT PAINTS/ EXTERIOR EMULSION PAINTS/ DISTEMPER/ ACRYLIC EMULSION PAINTS/ ENAMEL PAINTS & OIL PAINTS	ASIAN PAINTS/ BERGER PAINTS/ GOODLASNEROLAC/ JHONSON NICHOLSON/
14	WALL PUTTY	BIRLA WHITE/JK CEMENT
15	FALSE CEILING / PARTITION	INDIA GYPSUM/ ARMSTRONG/ LAFARGEBORAL GYPSUM LIMITED/LUXALON

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16	FALSE FLOORING	EVEREST INDUSTRIES/LLOYD INSULATIONS/MULTI FLOORS/UNITED ACCESS FLOORS/UNIVERSAL BUILDING PRODUCTS
17	DECORATIVE LAMINATES	DECOLAM/NATIONAL/ FORMICA/ GREENLAM/ CENTURY (MERINO)
18	FRP DOORS	RAJASHRI PLASTIC/ ACCUCEL/ OMEGA FIBRES/ THERMODECK/ ASTRAL
19	DOOR CLOSERS/ FLOOR SPRING	EVERITE/ GARNISH/ HARDWYN/ DORMA/ GODREJ
20	SEALANTS	GE SILICON/ DOW CORNING/ BOSTIK/ PIDLITE INDUSTRIES/SIKA/FOSROC/CICO/CHOWSKEY
21	CONCRETE PAVER BLOCKS	BASANTBETON/ COBBLE STONES/ ABIDEEP INTERLOCK PAVERS/ PVT. LTD./ PAVE STONE MARKETING (P) LTD./ DESIGNERS PAVINGS& TILES PVT. LTD./BESSERS CONCRETE PAVER BLOCKS.
22	SANITARY APPLIANCES	PARRYWARE/HINDWARE/JAGUAR/KOHLER
23	CP BRASS FITTINGS/WASTE COUPLINGS/ BOTTLETRAPS	JAGUAR/ ESSCO/ NOVA/ GEM/ MARC/ ESSESS/JUPITERAQUA /GROHE.
24	PVC FLUSHING CISTERNS	PARRY WARE/ HINDWARE/ JAGUAR/KOHLER
25	MIRROR	SAINT GOBAIN/ MODIGAURD/ ATUL GLASS WORKS/
26	STAINLESS SINK	NIRALI/ DIAMOND/ JAQUAR DAYANA/ AMC/HINDWARE
27	GI PIPES	TATA/ JINDAL/ZENITH/GST/JSW
28	GI MALLEABLE FITTINGS	UNIK/ZOLOTOPEC/MJM/ BIMAL
29	GM GATE/ GLOBE VALVES/CHECK VALVES	NETA/SANT/NEW/LEADER/AIDCO/IVC
30	BALL VALVES	MBM/ TECHNO
31	SW PIPES & GULLEY TRAPS	PERFECT KASHMIRA/ SOUTH INDIA CORPORATION/ TACEL/ INDO PIPES
32	RCC HUME PIPES	INDIAN HUME PIPES/ CANARA CEMENT PIPES/ KARNATAKA CEMENT PIPES
33	HDPE/UPVC PIPES & FITTINGS	PRINCE/FINOLEX/ SUPREME/ KITEC/ ORIPLAST/ POLYFAB/ SANGIR/ ORIPLAST/ VARUNA PIPES/SHREE DARSHAN PIPES
34	CPVC PIPES & FITTINGS	FLOWGAURD (ASTRAL)/ FINOLEX / SUPREME/ASHIRWAD
35	MODULAR FLOORS (CAVITY FLOOR)	UNITILE/LLOYD/MEROTSK
36	CI MANHOLE COVERS	NECO/SREE BHUWANESHWARA ENTERPRISES
37	PVC STORAGE TANKS	SINTEX/ INFRA/ ICP (INDIA) PVT. LTD. CENTURY/POLYCON
38	CEMENT	ACC/ AMBUJA CEMENT/ULTRA TECH CEMENT/DALMIA/BIRLA SUPER
39	REINFORCEMENT STEEL AND STRUCTURAL STEEL	SAIL/ TATA STEEL/ RINL/JSW/ VIZAG/JINDAL
40	ADMIXTURES	FOSROC/SIKA/ROFF/BASF
41	ACID / ALKALI PROOF LINING	KOTHARI CORROSION CONTROLLERS/ COROMANDEL PRODORITE
42	PVC PIPES	SUPREME/ INFRA/ PRINCE/ FINOLEX



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43	ANTI TERMITE TREATMENT	PEST CONTROL INDIA LTD/ MYSODET LTD/ ASHOK PEST CONTROL/ PEST CONTROL/ CHRISLINE MARKETING AGENTS
44	APP MODIFIED BITUMEN WATER PROOFING MEMBRANE	STP/ BITUMAT/ SIKA/ IWL/ PIDILITE TEXSA
45	WATER PURIFIER	KENT/ EUREKA FORBES(AQUA GUARD)/PHILIPS
46	STAINLESS STEEL HANDRAILS/ BALUSTRADE	KICH/ TECHBYTE
47	ROOF SHEET (CLADDING/ ROOFING)	TATA/ JINDAL/ SAIL/ JSW/ CRILL/ ESSAR/ BHUSHAN
48	UPVC WINDOW	FENESTA/ ELGI ENCRAFT/PLASOWIN/ EUROWIN/ REHAU/ EVOLUTION/ DECEQNICK
49	MOSQUITO MESH	FENESTA/ EVOLUTION/ DECEQNICK
50	DOOR LOCKS	GODREJ/DORMA/EUROPA
51	ANCHOR FASTENERS	FISCHER/HILTI
52	GLAVANISED GRATING	BHOLARAM/CELLCOM/GREATWELD/INDIANA/JACINTH/KANA DE/OMAKAR/PINAX/PREMIER/SUTTATTI/VINFAB
53	WATER PUMP MOTOR	KIRLOSKAR/GRUNDFOSS/CGL
54	PLYWOODS/LAMINATES/VEENERS	GREENPLY/DURO/CENTURY/KITPLY/ARCHID
55	ACID RESISTANT TILES	H&R JOHNSON/REGENCY CERAMICS
56	UPVC GUTTER	AQUASTAR/EUROGUARD/AKODRANAGE

<b>INSTRUMENTATION &amp; TERMINAL AUTOMATION SYSTEM</b>		
<b>SL. NO</b>	<b>INSTRUMENTS</b>	<b>APPROVED MAKES/BRANDS/VENDORS</b>
1	BATCH CONTROLLER	DANIEL (EMERSON PROCESS CONTROLS)/ SMITH (FMC TECHNOLOGIES)/ HONEYWELL / CONTREC/ GE (AST)/ BOPP & REUTHER
2	PD METER WITH PULSE TRANSMITTER	LIQUID CONTROLS / IDEX/ BRODIE
3	STRAINER & AIR ELIMINATOR(SIZED & INTEGRATED WITH PD METER & DCV)	LIQUID CONTROLS/ SMITH/ FLASH POINT / TOSHNIWAL CRYOGENIC/ BROOKS/ TELTECH/ STEEL STRONG
4	PNEUMATIC CONTROL VALVE / SHUTDOWN VALVE (GLOBE TYPE)	FISHER-SANMAR/ INSTRUMENTATION LTD/ DRESSER INDUSTRIES (MASONEILAN)/ SAMSON CONTROLS(GLOBE TYPE)/ FORBES MARSHALL (ARCA)/ MIL CONTROLS/ FLOWSERVE.METSO/ CCI VALVE TECHNOLOGY GMBH
5	DIGITAL CONTROL VALVE	LIQUID CONTROLS / IDEX/ BRODIE
6	PNEUMATIC CONTROL VALVE / SHUTDOWN VALVE (BALL TYPE)	1 KITZ CORPORATION OF EUROPE SA
		2 MOTOYAMA ENGINEERING WORKS
		3 VIRGO
		4 FLOWSERVE PTE LTD
		5 KITAMURA VALVE MANUFACTURING CO LTD
		6 METSO AUTOMATION
		7 PENTAIR VALVES & CONTROLS INDIA PVT LTD
		8 TYCO SANMAR LIMTIED
		9 ARGUS
		10 MOGAS
		11. FISCHER
		12. KTM
		13. WEIR VALVES
7	VALVES : CONTROL VALVE/ ON OFF VALVE- BUTTERFLY	1 MOTOYAMA ENGINEERING WORKS
		2 EMERSON (FISHER-ROSEMOUNT)
		3 FISHER SANMAR LIMITED
		4 FLOWSERVE PTE LTD
		5 INSTRUMENTATION LIMITED
		6 METSO SIGAPORE PTE LTD
		7 PENTAIR VALVES & CONTROLS INDIA PVT LTD
		8 SAMSON CONTROLS PVT LTD
		9 TYCO SANMAR LIMTIED
8	ACTUATORS (ROTARY - PNEUMATIC) – FOR SHUTDOWN SERVICES	1 BIFI
		2 EMERSON (FISHER-ROSEMOUNT)
		3 ROTORK
		4. METSO
9	SELF ACTUATED PCV	1 DRESSER VALVE INDIA PVT LTD
		2 ELSTER-INSTROMET NV
		3 EMERSON (FISHER-ROSEMOUNT)
		4 NIRMAL INDUSTRIAL CONTROLS PVT LTD
		5 JORDON VALVE

## TENDER-B VENDOR LIST

10	RADAR LEVEL GAUGE WITH TANK SIDE INDICATOR	SAAB ROSEMOUNT (EMERSON)/ ENRAAF/ E&H
11	AVERAGING TEMP SENSOR FOR TANKS	SAAB ROSEMOUNT (EMERSON)/ ENRAAF/E&H
12	WATER INTERFACE MEASUREMENT SENSOR	SAAB ROSEMOUNT (EMERSON)/ ENRAAF/ E&H
13	PRESSURE GAUGE/DIFFERENTIAL PRESSURE GAUGE	WIKA/ MANOMETER INDIA/ A.N. INSTRUMENTS/ PRECISION INDUSTRIES/ GENERAL INSTRUMENTS/ WAAREE INSTRUMENTS/ FORBES MARSHALL/ INDUSTRIAL INSTRUMENTATION/ H.GURU/ PRICOL/ GE GAUGES
14	TRUCK PROVING TANK	FMC SANMAR / FLASH POINT/ BOPP & REUTHER/ LIQUID CONTROLS
15	PD METER PROVING TANK	FMC SANMAR / FLASH POINT/ TELTECH/ BOPP & REUTHER/ LIQUID CONTROLS
16	UPS	EMERSON/ APC/SCHNEIDER/ DB POWER/GUTOR/ CHLORIDE/ VERTIV
17	BATTERIES	AMCO-SAFT/ HBL-NIFE
18	LOADING ARM (TOP)	HEATLY AND GRESHAM/ TECHNICA/ ASSOCIATE ENGINEERS/ WOOD FIELD/ LIQUIP/ OPW
19	LOADING ARM (BOTTOM) FOR PRODUCT & VAPOUR	LIQUIP/ OPW/ EMCO WHEATON
20	API COUPLER / DRY BREAK COUPLERS	LIQUIP/ OPW/ EMCO WHEATON
21	EARTHING RELAY	SCULLY/ ANDERSON/ DANIEL/ OSNA/ HONEYWELL/ AST/ OPW
22	PROXIMITY CARD READER	WESTING HOUSE / DANIEL/ STAHL/ HONEYWELL
23	REMOTE INTERACTION TERMINAL (RIT)	BALIGA. TELTECH/ FCG/ FEPL/ SUDHIR SWICHTGEAR PVT.LTD
24	DENSITY METER	SMITH/ MICROMOTION / EMERSON/ BOPP & REUTHER/ E&H/ HEINRICHS MESSTEC UNIK/GMBH
25	RTD/ THERMOWELLS	GENERAL INSTRUMENTS/ NAGMAN/ ALTOP/ PYROELECTRIC/ TEMPSIN INSTRUMENTS/ ABB AUTOMATION/ E&H
26	JUNCTION BOX & CABLE GLAND	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 INDIA PVT. LTD./ KMG A TO Z SYSTEMS PVT. LTD. NEW DELHI/ COOPER CROUSE HINDS
27	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

## TENDER-B VENDOR LIST

28	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
29	POWER CABLE	KEC INTERNATIONAL/ KEI INTERNATIONAL/ POLYCAB/ TORRENT/ UNIVERSAL/ NICCO/ RADIANT/ RR KABLE/ CHORDS/ GEMSCABLE/ CCI/ LAPP
30	SIL 3 PLC	HIMA/ YOKOGAWA/ / EMERSON/ HONEYWELL/ ABB/ TRICONEX
31	SIL CERTIFIED RELAYS	OMRON/ PILZ/ PHOENIX/ ROCKWELL/ GM/ P&F/ MTL
32	DCS	YOKOGAWA/ EMERSON/ HONEYWELL/ INVENSYS/ ABB
33	BARRIER GATE	HEIDZ INDIA/ TECHNICA/ METACHEM
34	GUIDED WAVE RADAR	EMERSON (ROSEMOUNT)/ HONEYWELL (ENRAF) E&H/ VEGA/ MAGNETROL
35	COMPUTER CONSOLES	PYROTECH CONTROL INDIA/ RITTAL/ HOFFMANN
36	PANELS & ACCESSORIES	PYROTECH CONTROL INDIA/ RITTAL/ HOFFMANN
37	COMPUTER	HP/ DELL
38	MONITORS	SAMSUNG/ LG/ SONY/ HP/ DELL
39	SERVER	DELL/ HP/ IBM
40	DOT MATRIX PRINTER	WIPRO/ TVSE/EPSON/PANASONIC
41	LASER PRINTER	XEROX/ HP
42	PRESSURE TRANSMITTERS	ROSEMOUNT/ ABB/ YOKOGAWA/ HONEYWELL/ FUJI
43	PROXIMITY SWITCHES/LOADING ARM POSITION SENSOR	P & F/ TURCK /DANIEL
44	BARRIERS	P & F/ MTL/ STAHL
45	SURGE SUPPRESSION DEVICES	OBO BETARMANN/ MTL
46	THERMAL RELIEF VALVE	KEYSTONE
		SEBIM INDIA
		FAINGER LESER
		TYCO SANMAR
47	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.
48	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
49	PIPES	JINDAL PIPES/ SURYAROSHNI/ RATNAMANI/ INDIAN SEAMLESS/ MAHARASHTRA SEAMLESS/ BHEL/ SAW PIPES

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50	PIPES FITTINGS & FLANGES	GUJARAT INFRA PIPES/ TUBE PRODUCTS/ KWALITY/ VENUS/ PARVEEN IND./ STEWARDS & LLOYDS/ ADITYA FORGE LTD./ ALLIANCE FITTINGS & FORGINGS LTD. / SHIVANANDA PIPE FITTINGS LTD. CHENNAI./NL HAZRA & SONS/TEEKAY TUBES PVT. LTD
51	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
52	ETHERNET SWITCHES	N-TRON/ CISCO/ FOUNDRY/ NORTEL/ MOXA/ HIRSCHMANN/ NETGEAR/ JUNIPER/ BROCADE
53	RELAYS	OMRON/ TELE MECHANIQUE/ HONEYWELL/ OEN/ P&F/ GM
54	OVERSPILL DETECTOR	DANIEL/ TECHNICA/ WOODFIELD
55	UNIVERSAL HAND HELD CALIBRATOR(HART PROTOCOL)	YOKOGAWA/ EMERSON/ HONEYWELL
56	ELECTRONIC DISPLAY UNIT	MAGNETO DYNAMICS/ IRA
57	ESD PUSH BUTTON	SUDHIR SWITCH GEARS (P) LTD/ BALIGA/ FLAMEPACK/ FCG FLEXPRO/ EX-PROTECTA/
58	MANUAL CALL POINTS	SUDHIR SWITCH GEARS (P) LTD/ BALIGA/ FLAMEPACK
59	UTP/COMMUNICATION CABLE AND PASSIVE COMPONENTS	AMP/ SCHNEIDER/ ADC-KRONE/ SYSTIMAX/ CORNING
60	ADDITIVE INJECTION SKID & PANEL FOR BLUE DYE / MARKER / POWER / TURBO	ROCKWIN/ CHEMTROL/ DANIEL/ HONEYWELL ENRAF/ M&F
61	PROXIMITY CARDS	HID/ HONEYWELL/ SCHNEIDER ELECTRIC/ SIEMENS/BOSCH/ CARDAX
62	BULK POWER SUPPLY	DELTA/ LAMDA/ MITSUBISHI/ SIEMENS/ PHONEIX
63	LARGE VDU	LG/ SAMSUNG/ SONY
64	SEAL ENTRY DEVICE	STAHL/ DANIEL/ MTL ( EXTEC) / P&F/ADVANCED SYSTEK/ CONTREK
65	TFMS SOFTWARE	SAAB/ ENRAAF/ E&H
66	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
67	ORIFICE PLATE & FLANGES ASSEMBLY	MICRO-PRECISION/ IL/ STAR-MECH/ EUREKA INDUSTRIAL EQUIPMENTS/GENERAL INSTRUMENTS/ BALIGE LIGHTING EQUIPMENTS.
68	CABLE TRAYS	INDIANA/ PREMEIR/ ELCON/ SUMIP /VSL INSTRUMENTS /RELIANCE CABLE TRAYS/INDIAN CABLE TRAYS/SADHANA/ PREFAB ENGINEERS

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69	GAS DETECTORS	MSA/ DETECTION INSTRUMENTS/ DETECTOR ELECTRONICS/HONEYWELL ANALYTICS/ GENERAL MONITORS/ RIKEN KEIKI
70	CANOPIES(FRP)	FIBROCHEM/ SABRE- NISON CONSULTANTS
71	PREFABRICATED HOOKUPS	TBVHOOKUPS/EMERSONHOOKUPS/SCHNEIDER CLOSE COUPLINGS/ PARKER INSTRUMENTATION
72	INSTRUMENT AIR MANIFOLD(SS)	TECHNOMATIC CONTROLS/HYDROPNEUMATICS/SWAGELOK INDIA
73	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)
74	COPPER TUBES(COATED/BARE)	1 ALCOBEX METALS (PVT) LTD INDIA 2.RAJCOMETALINDUSTRIES P LTD(FORM.H092) INDIA
75	MCB'S	SIEMENS/ HAVELL'S/ MERLIN GERIN/ SCHNEIDER/ LEGRAND/ HAGER
76	PUSHBUTTONS – RESET PB'S FOR HOOTERS	BALIGA/ CEAG FLAMEPROOF/ FEPL/ FCG/ MEDC/ KHERAJ/ TECHNIK/SUDHIR SWITCH GEARS
77	BEACON'S	
78	HOOTERS	
79	AFR	SHAVO-NORGREN/ MARSH-BELLOFRAM/ PLACKA/ SCHRADER-SCHOVILL.
80	SOV'S	ASCO/ ROTEX/ HERION/ NORGREN
81	TB'S	WAGO/ PHEONIX/ WEIDMULLER
82	FUSES	BUSSMAN/SIBA
83	VIBRATING TYPE LEVEL SWITCH (SIL3)	E&H/ VEGA/EMERSON
84	CABLE GLANDS	EX-PROTECTA/ BALIGA LIGHTING EQUIPMENTS PVT LTD./ GOVAN/ RITTAL/ FLEXPRO/ FLAMEPROOF CONTROL GEARS/ HENSEL
85	MOTORISED ACTUATOR (MOV)	1. AUMA 2. ROTORK 3. FLOWSERVE 4. EIM 5. BIFFI
86	LIMITSWITCH	1. PEPPERL + FUCHS (INDIA) PVT.LTD. 2. ALLEN BARDLY (ROCKWELLAUTOMATION) 3. OSNA 4. TURCK
87	7.3 INSTRUMENT CABLE TRAYS / DUCT(GI)	1. VSLINSTRUMENTS 2. INDIAN CABLETRAYS 3. RELIANCE CABLETRAYS 4. SADHANA ENGGCORPORATION 5. PREFABENGINEERS

**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 & CABLE GLAND	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 PASSIVE COMPONENTS	AMP/ SCHNEIDER/ ADC-KRONE/ SYSTIMAX/ CORNING
14	NETWORK CORE/DISTRIBUTION SWITCH & 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

**TENDER-B VENDOR LIST**

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
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



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**FDA**



<b>SL. NO.</b>	<b>DESCRIPTION OF THE ITEM</b>	<b>APPROVED MAKES/BRAND/VENDORS</b>
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 CALL POINTS 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

**ACCESS CONTROL SYSTEM**

<b>Sl. No</b>	<b>INSTRUMENTS</b>	<b>APPROVED MAKES/VENDOR/BRAND</b>
1.	ACCESS CONTROL SYSTEM	HONEYWELL/ JOHNSON CONTROLS/SIEMENS/CARD KEY/ USA/BOSCH/EDWARDS / SCHNEIDER / CARDAX/ HID
2.	TURNSTILE	ELKOSTA/SHIVANANDA/MAGNETIC INDIA/ TANSAN/ MAGNETIC AUTO CONTROL/ SIVANANDA ELECTRONICS/ AUTOMATIC SYSTEMS/ BOOM EDAM/ CAME/ DORSET KABA/ FAAC/ GUNNEBO/ SAIMA/

**CCTV**

<b>Sl. No.</b>	<b>Description of the item</b>	<b>APPROVED MAKES/VENDOR/BRAND</b>
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/ LENOVO
4	LCD/LED DISPLAYSCREENS-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 TELSYN/BROCADE/ HP/ MOXA/ JUNIPER/ HIRSCHMANN// COMNET
7	FIBER OPTIC CABLES (SINGLE & MULTI MODE)	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 CONTROL GEARS/ 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
15	FUSES	BUSSMAN/ SIBA
16	CANOPY	FIBROCHEM/ SABRE-NISON

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	Section – A-2		Document No:	20005-GEN-G- DOC-9105	
Subsection – A-2.1	Rev:		1		

<b>A-2</b>	<b>PLANNING, SCHEDULEING AND MONITORING</b>
<b>A-2.1</b>	<b>PLANNING, SCHEDULEING AND MONITORING PROCEDURE</b>

## MRPL Marketing Terminal Project at Devangonhi, Bangalore


**PROJECT :** Marketing Infrastructure Projects, MRPL

**OWNER :** MANGALORE REFINERY AND PETROCHEMICALS LTD

**PMC :** Nauvata Engineering Pvt. Ltd.

**JOB NO. :** JBG20005


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## 1.0 OVERVIEW

Mangalore Refinery & Petrochemicals Ltd (MRPL) operates a 15 MMTPA crude processing refinery with secondary units and Petrochemical complex at Mangalore. MRPL is in possession of a 20 acres plot of land in Devangonhi near Bengaluru. MRPL proposes to utilize this land for setting up a Petroleum storage & Marketing Terminal to enhance and grow in its marketing business activities.

The proposed Terminal would cater to requirements of petroleum products for its own expanding Industrial & Retail business, primarily in the state of Karnataka & Kerala. The Terminal would receive finished petroleum products (MS, HSD & ATF) through the existing 363 Km long PMHB pipeline from MRPL. Suitable facilities would be provided in the Devangonhi Terminal. There will be a receipt & dosing of Ethanol with MS and Biodiesel with HSD. The supplies of petroleum products to the retail outlets / customer / aviation stations would be met through road tankers. The entire Terminal operations would comply with the applicable statutory regulations and QC guidelines.

In order to setup the Marketing Terminal within required schedule, entire scope of work is split into Four Separate LSTK Contracts details of which are as below.

1. Tender A: Tankage and its associated work including tank foundation, Dyke area Scope, all infield piping till Loading arm, MOV's, ROSOV, DBBV, all pumps and mechanical packages, Pipeline and FOC cables – LSTK basis.
2. Tender B: Civil/ structural / Architectural – for all roads, drain, Buildings (including Plumbing), Compound wall and Arch, providing permanent power sanction letter from BESCOM substation to BESCOM metering in terminal – LSTK basis.
3. Tender C: Electrical Distribution (from external source point), Transformers, 11 KV HV Panels, LV Panels, VFD Panels, APFCR panels. DG sets, Lighting system for the plant. Earthing and Lighting protection system. Instrumentation system such as DCS, SIL3 PLC, CCTV system, PAGA system, Wireless network, Telephone system, Control room panels for TFMS, LRCS, Terminal Automation System, Hydrocarbon detection system, Fire detection and Alarm system. Inline instrumentation, tankage instrumentation, Loading arm – LSTK basis.
4. Tender D: Mangalore refinery modification works – LSTK basis.

## 2.0 INTRODUCTION

This document 'Project Control Requirements', for the following Project control activities: Planning, Scheduling, Progress Measurement and Reporting for LSTK Tender B.

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



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SITE – geographical area designated for MRPL Marketing Terminal at Devangonhi, Bengaluru

HOME OFFICE Services – is CONTRACTOR’s performance of engineering, 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

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.

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CONTRACTOR shall provide the following Project Control documents upon award of project:

- Progress Measurement System
- Schedule – Level 1 and 2
- Milestones – key milestones for Engineering, 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

- 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,

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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

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 - Detail Engineering, 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 the release of 'Issued for Construction' engineering documents and 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.

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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 – Detail Engineering, 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 engineering, 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 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
- Engineering, 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 engineering, 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.

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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:

- Engineering Deliverables Status Reporting
- 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. 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

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/ 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 Detail Engineering, 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.

## 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.

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## 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
- Engineering 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 Engineering, 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.

Engineering progress

- Major Disciplines

Procurement, Subcontracting and Expediting Services

- Equipments / Items / Materials
- Bulk Materials

Construction progress curves

- 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 Engineering, histograms shall be prepared for each discipline; 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. Engineering Manpower Schedule

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CONTRACTOR shall submit in the Monthly Report the “Manpower Schedule for Engineering Services” along with “Manpower Histogram for Engineering Services” in a tabular form.

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
- PMC / MRPL Organization Structure. However, CONTRACTOR shall not change the grouping of personnel identified in the above formats.
- Designations indicated in the proposed Organization Chart, Manpower Schedule and all other related documents shall be identical.
- “Manpower Schedule for Engineering Services” shall reflect only the manpower required for HOME OFFICE Services, including Subcontractors’ manpower for specialty services required if any, for the entire duration of contract.

#### 7.2.4. 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. Engineering, Procurement & Subcontracting, Construction, Pre commissioning & Commissioning, As-built and Project Closure.

Weightage for Engineering, 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 (%)
Engineering	
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.

#### 7.6.1. Engineering Progress

##### Engineering Deliverable Register

A database shall be prepared listing all engineering deliverables to be developed disciplinewise. Based on the detailed schedule, requirement dates shall be incorporated for each deliverable.

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The register shall include all procedures, studies, reports, data sheets, specifications, drawings, material requisitions or other documents to be produced during Engineering phase.

CONTRACTOR's system shall be capable of producing Summary and Discipline level reports to meet PMC / MRPL's requirements and made available to PMC / MRPL as required.

This database shall be capable of generating reports to meet PMC / MRPL requirements such as,

- Summary table by discipline and by type of deliverable planned together with actual achievements for the period and cumulative.
- Deliverables already completed and issued.
- Deliverables planned for completion but not completed.
- Deliverables due for issue in next period.

Guidelines for the format of these reports are provided in Attachments 7 and 8.

#### Progress Evaluation

Weightage shall be established for each deliverable based on the estimated manhours. CONTRACTOR shall follow the percentage stage progress as below for various stages for each types of documents (Specifications, Datasheets, Reports, MTOs, etc.) and drawings for PMC / MRPL review and approval.

#### a) Approval Category documents


Activity	Progress (%)	
	Incremental	Cumulative
Start	10%	10%
Draft Complete	10%	20%
Issue for IDC	25%	45%
IDC Closure	0%	45%
Issue for PMC / MRPL review	15%	60%
Receive PMC / MRPL comments	0%	60%
Issue for PMC / MRPL Approval	30%	90%
Receive PMC / MRPL Approval	0%	90%
Issue as IFC / AFC	10%	100%

#### b) Review Category documents

Activity	Progress (%)	
	Incremental	Cumulative
Start	10%	10%
Draft Complete	10%	20%
Issue for IDC	25%	45%
IDC Closure	0%	45%
Issue for PMC / MRPL review	15%	60%
Receive PMC / MRPL comments	0%	60%
Issue for Information	40%	100%

#### c) Documents for Safety Studies (HAZOP, etc.)

Activity	Progress (%)	
	Incremental	Cumulative
Start	10%	10%
Draft Complete	10%	20%
Issue for IDC	25%	45%

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IDC Closure	0%	45%
Issue for PMC / MRPL review	15%	60%
Receive PMC / MRPL comments	0%	60%
Issue for HAZOP	10%	70%
Receive HAZOP Recommendation	0%	70%
Issue for PMC / MRPL Approval	20%	90%
Receive PMC / MRPL Approval	0%	90%
Issue as IFC / AFC	10%	100%

d) Information Category documents

Activity	Progress (%)	
	Incremental	Cumulative
Start	10%	10%
Draft Complete	10%	20%
Issue for IDC	25%	45%
IDC Closure	0%	45%
Issue for Information	55%	100%

e) MTOs

Activity	Progress (%)	
	Incremental	Cumulative
1 <sup>st</sup> MTO Submission	50%	50%
2 <sup>nd</sup> MTO Submission	30%	80%
3 <sup>rd</sup> MTO Submission	20%	100%

## 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.

### 7.7.1. 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. 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.

### 7.7.2. 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.

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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.


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.

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## 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.

### 7.10.1. START-UP Schedule and Systems Completion Schedule

Requirements for these schedules are contained within the Planning and Scheduling Procedure.

### 7.10.2. 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 ENGINEERING PROGRESS

Progress is a key factor in the control of engineering and procurement schedules. An accurate measurement of progress serves as a basis for office manhour forecasts as well as an indicator for performance against the project schedule and budget.


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.

Progress (percent complete) is measured by using a weighted average method of computing "earned" hours or work units. The progress reporting system will be set up as soon as a reasonable breakdown of drawings, specifications and other activities is available for the various design disciplines.

The Control Level Schedules provide a listing/grouping of all deliverables (drawings, specifications, etc.) and activities required for the project. Estimated hours or work units are allocated to each line item, thus assigning a "weight" relative to the respective discipline control budget. By determining the "percent complete" for each item at the end of a reporting period, the earned hours are calculated as follows.

$$\text{Percent Complete} \times \text{Budget Hours} = \text{Earned hours}$$

The total earned hours from work completed, divided by the total control budget hours determines the "percent complete" or physical progress for each discipline. Utilising this same weighted average method based on "earned" hours, progress is then summarised by unit / system / discipline and total project.

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### 8.2.1. Engineering Performance

Home office performance is calculated using the following formula.

$$Performance = \frac{Earned\ hours}{Expended\ Hours}$$

Thus, performance is a measure of work accomplished versus actual expenditures and is calculated on both an incremental and cumulative basis at the end of each reporting period. A calculation greater than 1.00 indicates work is being performed more efficiently than that defined by the control budget, whereas a performance less than 1.00 is an indication of less efficient work. Significant Changes either way will be cause for a potential deviation.

### 8.2.2. 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

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.

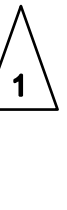
Reports shall be issued both in hard copy and electronic format.


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.



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CONTRACTOR is required to prepare the report with an Executive Summary and detailed sections as defined below:

- Executive Summary
- Detailed Report
- Overall Safety / HSE
- Engineering
- 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.
- 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 MPRL'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.

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#### 9.1.2. Engineering Services

- Summary status for engineering deliverables, represented as a comparison of the number of deliverables planned/actual/forecast. Broken down by discipline and type, the number of deliverables shall be shown for each key step in the development and approval process.
- Progress curves and manpower histograms for overall engineering and each major discipline, showing planned, actual and forecast progress.

#### 9.1.3. 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.

#### 9.1.4. 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.

#### 9.1.5. 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.

### 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, Engineering, 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 engineering, 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



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- 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.

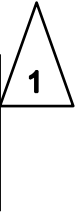
#### 9.2.4. Progress Photographs and 3D CAD views

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

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

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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. Engineering Progress
6. Procurement Progress
7. Subcontracting Progress
8. Construction Progress
9. 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

##### 12.1 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.

##### 12.2 CHANGE IDENTIFICATION

###### 12.2.1. Contractor Identified Changes

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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.

#### 12.2.2. 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.

#### 12.2.3. 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.

#### 12.2.4. 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. CONTRACTOR shall supply PMC / MRPL with a CPM Network including the basis for original and revised logic and durations.

### 12.3 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.

### 12.4 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.





Part – A  
Section – A-2  
Subsection – A-2.1

MRPL Marketing Terminal Project at Devangonhi, Bangalore

PLANNING, SCHEDULING AND MONITORING PROCEDURE

ATTACHMENT 2: MANPOWER DEPLOYMENT SCHEDULE

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Sl. No.	Designation	Category	Peak (Nos.)	No. of Persons Planned to be Deployed																																Total Est. (Man-months)	Total Est. Man-hours				
				M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32			M33	M34	M35	
1	Project Management Services																																								
	a) Project Manager																																								
	b) Project Engineer																																								
	c) Project Control Manager																																								
	d) Planning & Scheduling Engineer																																								
e) Cost Estimation / Cost Control Engineer																																									
<b>Sub Total (1)</b>																																									
2	Engineering Services (Engineers Only)																																								
	a) Engineering Manager																																								
	b) Process Manager																																								
	c) Process Engineer																																								
	d) Piping Engineer																																								
	e) Static Equipment Engineer																																								
	f) Pressure Vessels Engineer																																								
	g) Rotating Equipment Engineer																																								
	h) Civil / Struct. Engineer																																								
	i) Arch. Engineer																																								
	j) Electrical Engineer																																								
	k) CP Engineer																																								
	l) Instr. Engineer																																								
	m) SMC & Telecom Engineer																																								
n) HSE Engineer																																									
o) Others (Please specify)																																									
<b>Sub Total (2)</b>																																									
3	Procurement Services																																								
	a) Procurement Manager																																								
	b) Procurement Engineer / Buyer																																								
c) Others (Please specify)																																									
<b>Sub Total (3)</b>																																									
4	Contracting Services																																								
	a) Contracts Manager																																								
	b) Contracts Engineer																																								
c) Others (Please specify)																																									
<b>Sub Total (4)</b>																																									
5	Construction & Commissioning Services																																								
	a) Construction Coordinator / Manager																																								
	b) Pre-Commissioning / Commissioning Coordinator																																								
c) Others (Please specify)																																									
<b>Sub Total (5)</b>																																									
6	Design / Drafting Services																																								
	a) Designer																																								
	b) CAD Operator																																								
c) Draftsmen																																									
<b>Sub Total (6)</b>																																									
7	Document Control																																								
	a) Document Controller																																								
<b>Sub Total (7)</b>																																									
8	Other Services																																								
	a) QA/QC Manager																																								
	b) QA/QC Engineer																																								
c) Others (Please specify)																																									
<b>Sub Total (8)</b>																																									
<b>Overall Manpower = Sum of Subtotals (1,2,3,4,5,6,7,8)</b>																																									
<b>Overall Manhours</b>																																									

**Notes:**

- a) Indicate part-time requirement wherever applicable.
- b) Man-hour requirements corresponding to Secretaries, Computer Operators, Documentation Clerks, Accountants and other office Personnel etc. required if any, shall not be included herein.
- c) Above "Designations/Titles" are only indicative and shall be in line with the organization structure proposed by the Tenderer.
- d) Total Estimated Man-hours shall be computed on the basis of 170 man-hrs / month (40 man-hrs / week) for Home Office.
- e) "Contract Services" also include award of subcontracts and their Administration.
- f) Please fill number of persons proposed to be mobilized against each month in the above table.



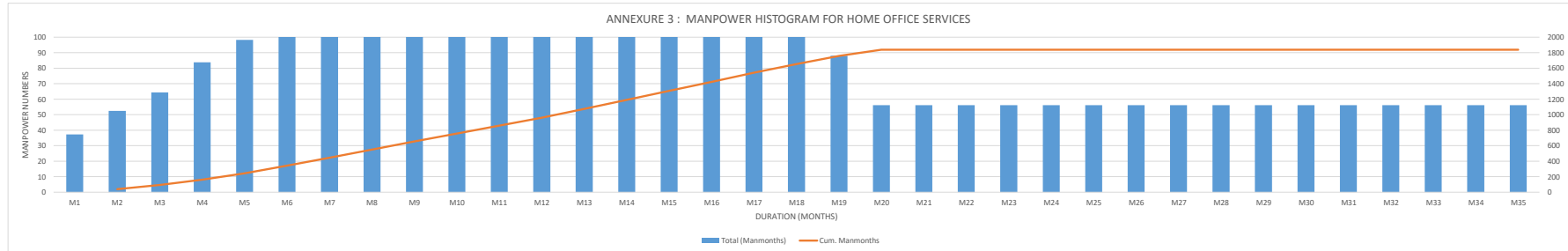
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Marketing Infrastructure Projects, MRPL

Part - A  
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Subsection - A-2.1

PLANNING, SCHEDULING AND MONITORING PROCEDURE

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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	6	6
Engineering Services	27.2	31.1	40	50	60	60	60	60	60	60	60	70	70	70	70	70	65	60	50	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Procurement Services	2	4	6	6	6	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		
Construction & Commissioning Services	0.1	0.1	1.1	1.5	3	4	6	6	6	6	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>37.3</b>	<b>52.4</b>	<b>64.3</b>	<b>83.8</b>	<b>98.3</b>	<b>102.3</b>	<b>104</b>	<b>104</b>	<b>106.3</b>	<b>101</b>	<b>101</b>	<b>115</b>	<b>115</b>	<b>117</b>	<b>117</b>	<b>117</b>	<b>112</b>	<b>105</b>	<b>88</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</b>	<b>56.2</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>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>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>		

The above is indicative only. Contractor may modify the list as per the Project scope and requirements





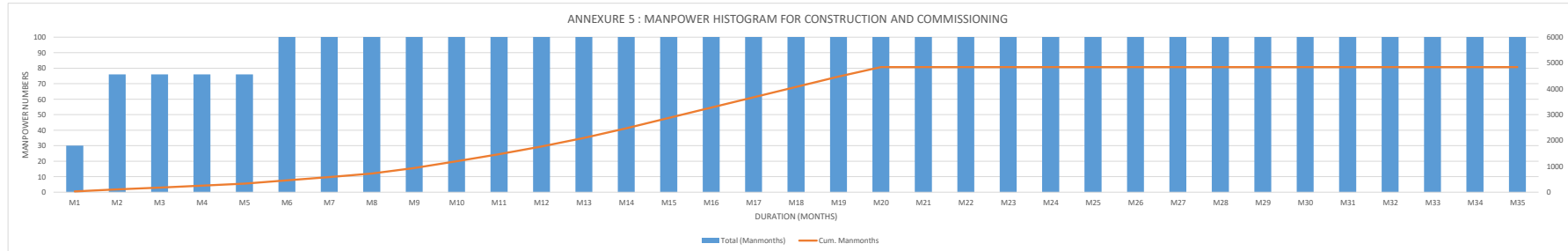
Part - A  
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Description	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	Total Manmonths	Total Manhours	
Direct Manpower Nos ( Field Supervision Staff )	5	15	15	15	15	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	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	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	50	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>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>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>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 7: ENGINEERING DOCUMENT AND DELIVERABLE REGISTER

Sl. No.	WBS Number	Discipline	Document Number	Document Description	Document Category / Class	Weightage (%)	Plan / Act / For	Start	Draft Complete	Issue for IDC	IDC Complete	Issue for PMC / MRPL review	Receive PMC / MRPL Comments	Issue for PMC / MRPL Approval	Receive PMC / MRPL Approval	Issue as AFC / IFC	Earned Progress	Plan (%)	Act (%)	Remarks		
Incremental Progress (%)																						
Cumulative Progress (%)																						
							Plan															
							Act															
							For															
							Plan															
							Act															
							For															
							Plan															
							Act															
							For															
							Plan															
							Act															
							For															

- Note:
- a All Engineering Deliverables such as Drawings, Reports, Specifications, Datasheets, etc. shall be listed using this template.
  - b All Bulk Quantities (MTOs) shall be listed using this template
    - i. Preliminary MTO (1st Issue) shall be indicated under "Issue for PMC / MRPL review" column
    - ii. Intermediate MTO (2nd Issue) shall be included under "Issue for PMC / MRPL Approval" column
    - iii. Final MTO (3rd Issue) shall be included under "Issue as AFC / IFC" column





Part – A  
Section – A-2  
Subsection – A-2.1

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ATTACHMENT 9: PROCUREMENT SERVICES STATUS REGISTER

TENDER NO.  
DOCUMENT NO.  
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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	
<b>Incremental Progress (%)</b>																														
<b>Cumulative Progress (%)</b>																														
						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





Part – A  
Section – A-2  
Subsection – A-2.1

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TENDER NO. 3200000490  
DOCUMENT NO. 20005-GEN-G-DOC-9105  
REV. 1



**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%

Spooled 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 18  
Milestone Certificate

Project Number	
Project Name	
<b><u>MILESTONE CERTIFICATE</u></b>	
Milestone Number	
Description	
Date Planned	
Date Achieved	

\_\_\_\_\_

Contractor

\_\_\_\_\_



PMC / MRPL

\_\_\_\_\_

Date

\_\_\_\_\_

Date

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Attachment 19  
Milestone Summary Status

**SUMMARY SHEET OF MILESTONES ACHIEVED TILL DATE**

Project Number _____	Project Name _____
Month _____	Invoice Number _____
Invoicing Period _____	Date _____

Milestone Ref. No.	Contractual Month	Description	Planned Date	Actual Date	Transmittal Reference

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
PMC / MRPL





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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								
ENGINEERING								
PROCUREMENT & SUBCONTRACTING								
CONSTRUCTION								
PRE COMMISSIONING & COMMISSIONING								
AS BUILT DOCUMENTATION								
PROJECT CLOSURE								
<b>OVERALL</b>								

APPROVED BY	
SIGN	
NAME	
DATE	



Part – A  
Section – A-2  
Subsection – A-2.1

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**ATTACHMENT 21: ENGINEERING PROGRESS SUMMARY**

Project Number	
Project Description	

Month	
Cutoff Date	

DESCRIPTION	WEIGHTAGE (%)	CUMULATIVE PROGRESS (%)		INCREMENTAL/ MONTH PROGRESS (%)		REVIEWED		REMARKS
		PLAN	ACTUAL	PLAN	ACTUAL	BY	SIGN	
GENERAL								
PROCESS								
SAFETY (HSE)								
PIPING								
CIVIL / STRUCTURAL / ARCHITECTURAL								
MECHANICAL								
ELECTRICAL								
INSTRUMENTATION								
TELECOMMUNICATION								
PIPELINES								
<b>OVERALL ENGINEERING</b>								

CERTIFIED BY	
SIGN	
NAME	
DATE	



Part – A  
Section – A-2  
Subsection – A-2.1

MRPL Marketing Terminal Project at Devangonhi, Bangalore  
Marketing Infrastructure Projects, MRPL

PLANNING, SCHEDULING AND MONITORING PROCEDURE

TENDER NO.  
DOCUMENT NO.  
REV.

3200000490  
20005-GEN-G-DOC-9105  
1



**ATTACHMENT 22: PROCUREMENT / SUBCONTRACTING PROGRESS SUMMARY**

Project Number		Month	
Project Description		Cutoff Date	

DESCRIPTION	WEIGHTAGE (%)	CUMULATIVE PROGRESS (%)		INCREMENTAL/ MONTH PROGRESS (%)		REVIEWED		REMARKS
		PLAN	ACTUAL	PLAN	ACTUAL	BY	SIGN	
GENERAL								
PROCESS								
SAFETY (HSE)								
PIPING								
CIVIL / STRUCTURAL / ARCHITECTURAL								
MECHANICAL								
ELECTRICAL								
INSTRUMENTATION								
TELECOMMUNICATION								
PIPELINES								
<b>OVERALL ENGINEERING</b>								

CERTIFIED BY	
SIGN	
NAME	
DATE	



Part – A  
Section – A-2  
Subsection – A-2.1

**MRPL Marketing Terminal Project at Devangonhi, Bangalore  
Marketing Infrastructure Projects, MRPL**

**PLANNING, SCHEDULING AND MONITORING PROCEDURE**

TENDER NO.  
DOCUMENT NO.  
REV.

3200000490  
20005-GEN-G-DOC-9105  
1



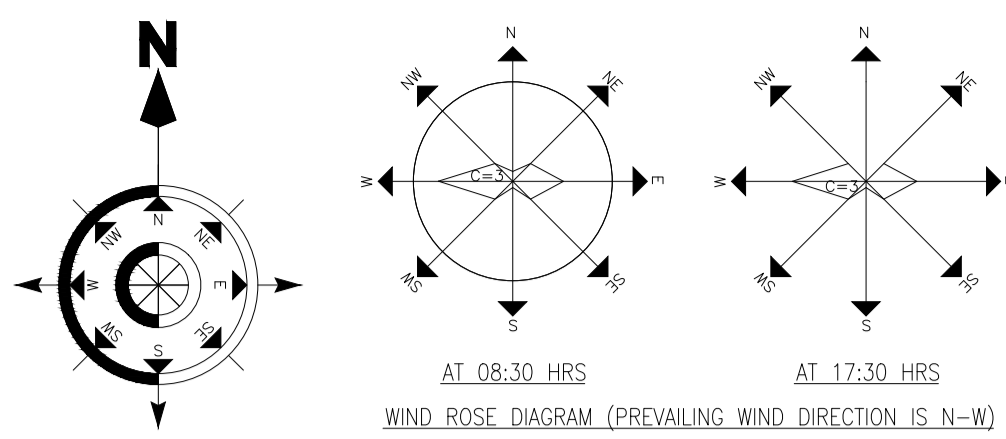
**ATTACHMENT 23: CONSTRUCTION PROGRESS SUMMARY**

Project Number	
Project Description	

Month	
Cutoff Date	

DESCRIPTION PLANT / UNIT / FACILITY /	WEIGHTAGE (%)	CUMULATIVE PROGRESS (%)		INCREMENTAL/ MONTH PROGRESS (%)		REVIEWED		REMARKS
		PLAN	ACTUAL	PLAN	ACTUAL	BY	SIGN	
<b>OVERALL ENGINEERING</b>								

CERTIFIED BY	
SIGN	
NAME	
DATE	



S.NO.	TAG NO.	PRODUCT	NO. OF PUMPS
1	GA-A-01A/B/C	MS	2(1W+1S) + 1 FUTURE
2	GA-A-02A/B/C/D	HSD	3(2W+1S) + 1 FUTURE
3	GA-A-03A/B/C	ATF	2(1W+1S) + 1 FUTURE
4	GA-A-04A/B/C	BIO-DIESEL	3(2W+1S)
5	GA-A-05A	INTERFACE	1
6	GA-A-06A/B/C	ETHANOL	3(2W+1S)
7	GA-A-07A/B	MS ADDITIVE	2 (1W+1S)
8	GA-A-08A/B	HSD ADDITIVE	2 (1W+1S)
9	GA-A-09A	MS VERTICAL	1
10	GA-A-10A	HSD VERTICAL	1
11	GA-A-11A	SLOP OIL TRANSFER	1
12	GA-A-16A/B	ATF ADDITIVE	2 (1W+1S)
13	GA-A-18	METER CALIBRATION	1
14	GA-A-23A/B	OWS SUMP	2 (1W+1S)
15	GA-A-26A/B	RAW WATER	2 (1W+1S)
16	GA-A-27A/B/C/D	BOREWELL	4 (3W+1S)
17	GA-A-28A/B	POTABLE WATER	2 (1W+1S)
18	GA-A-29	TT CALIBRATION RECYCLE	1
19	GA-A-30A/B	CORROSION INHIBITOR	2 (1W+1S)
20	GA-A-802A/B	FIREWATER TRANSFER	2 (1W+1S)

NOTES :

- ALL DIMENSIONS, CO-ORDINATES AND LEVELS ARE IN METERS, UNLESS NOTED OTHERWISE.
- THIS FACILITIES ARE DESIGNED AS PER OISD 117 / OISD 244.
- ALL THE FACILITIES DIMENSIONS ARE PRELIMINARY AND TO BE FINALISED DURING LSTK DETAIL ENGINEERING STAGE.
- FGL OF THE PLANT VARIES FROM 900.00M TO 901.25M
- GREEN BELT AREA SHALL BE GRADED SUITABLY TO PROVIDE PROPER SLOPES FOR DRAINAGE TO NEAREST DITCH OR STORM WATER OUTLETS.
- DYKE WALL HEIGHT SHALL BE 2.0 M & 0.3 M WIDTH.
- FIRE WALL HEIGHT SHALL BE 600 MM.
- LOCATION AND DIMENSIONS FOR BESCOM TARIFF METERING YARD IS INDICATIVE ONLY AND SAME SHALL BE UPDATED AS PER VENDOR DATA DURING DETAIL ENGINEERING STAGE.
- PLOT PLAN IS INDICATIVE ONLY HOWEVER ANY CHANGES SHALL BE DONE WITH CONSULTATION OF PMC.
- TENTATIVE LOCATION OF EXISTING MHB PIPELINE INDICATED. LSTK CONTRACTOR TO ASCERTAIN THE EXACT LOCATION OF THE PIPE LINE DURING DETAIL ENGINEERING.
- CONSIDERING CLEARANCE OF 8M TOWARDS NORTH SIDE AND 12M TOWARDS SOUTH SIDE, THE EXACT ROAD WIDTH IS NARROW WHICH HAS BEEN EXTENDED AS INDICATED TO 7M TO MEET VEHICLE MOVEMENT REQUIREMENTS.
- TENTATIVE ROUTING FOR NEW 14" FEED LINE INDICATED. EXACT ROUTING AND LENGTH TO BE ASCERTAINED DURING DETAIL ENGINEERING BY LSTK CONTRACTOR.
- STRUCTURE SHALL BE MADE COMPLETE FOR GANTRY-2 (INCLUDING FUTURE) & SHALL BE COMPLETE IN ALL ASPECT, EXCEPT THE 6 FUTURE LOADING ARM RELATED INSTRUMENTS AND PIPING AS PER P&ID REQUIREMENT.
- PROVISION FOR EXTERNAL WATER SUPPLY TO BE MADE AVAILABLE SO AS TO CATER WATER REQUIREMENT SHORTAGE DURING EMERGENCY.
- IN TOTAL THERE ARE 5 NO. OF GATES COMING IN THE TERMINAL BOUNDARY LIMITS AS INDICATED OUT OF WHICH 2 NO. OF GATES ARE 7M WIDTH & 3 NO. OF GATES ARE 4M WIDTH.

LEGEND :

GREEN BELT - [Pattern]

RCC ROAD - [Pattern]

FENCE - [Symbol]

PAVEMENT - [Pattern]

WATCH TOWER - [Symbol]

EXISTING - [Symbol]

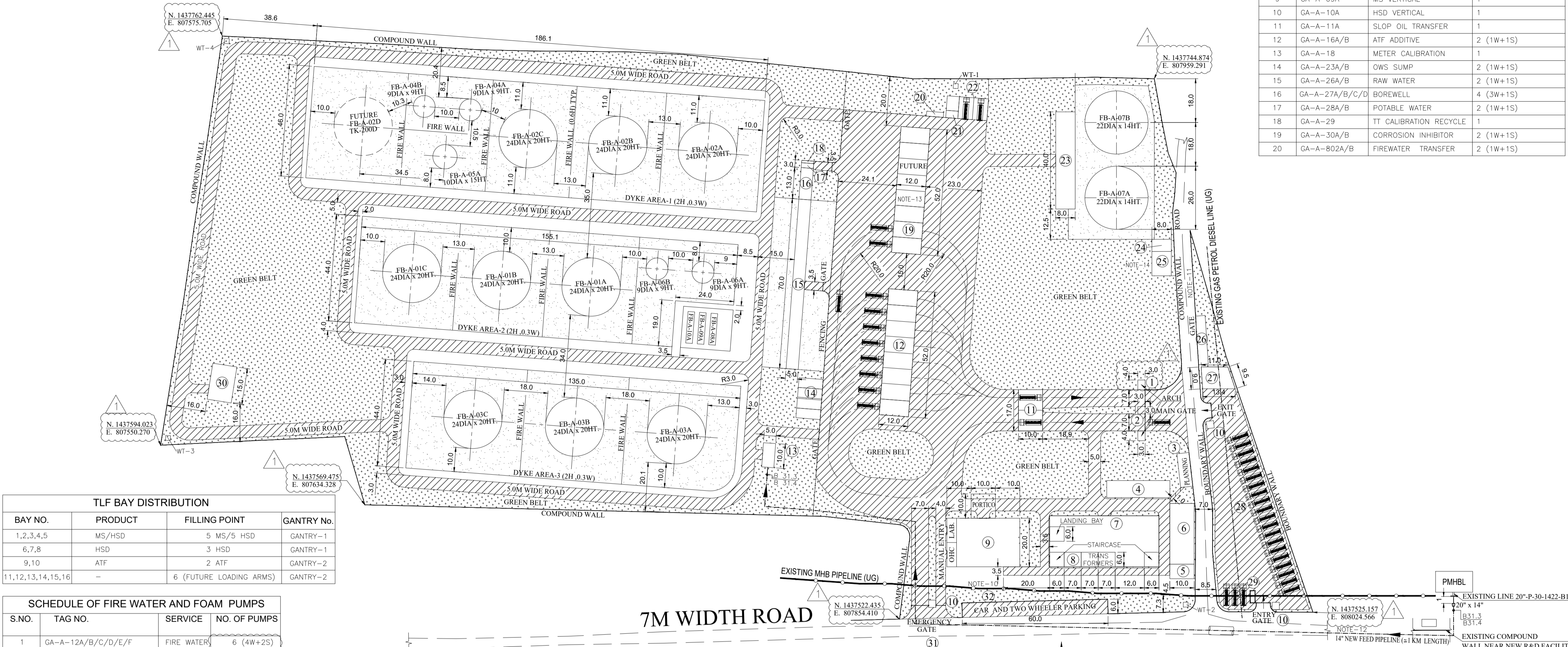
UG PIPELINE - [Symbol]

AREA CHART

PLANT AREA WITHIN COMPOUND WALL = 19.43 ACRES

FACILITIES AREA = 12.77 ACRES

GREEN BELT AREA = 6.66 ACRES (34.30%)



BAY NO.	PRODUCT	FILLING POINT	GANTRY No.
1,2,3,4,5	MS/HSD	5 MS/5 HSD	GANTRY-1
6,7,8	HSD	3 HSD	GANTRY-1
9,10	ATF	2 ATF	GANTRY-2
11,12,13,14,15,16	-	6 (FUTURE LOADING ARMS)	GANTRY-2

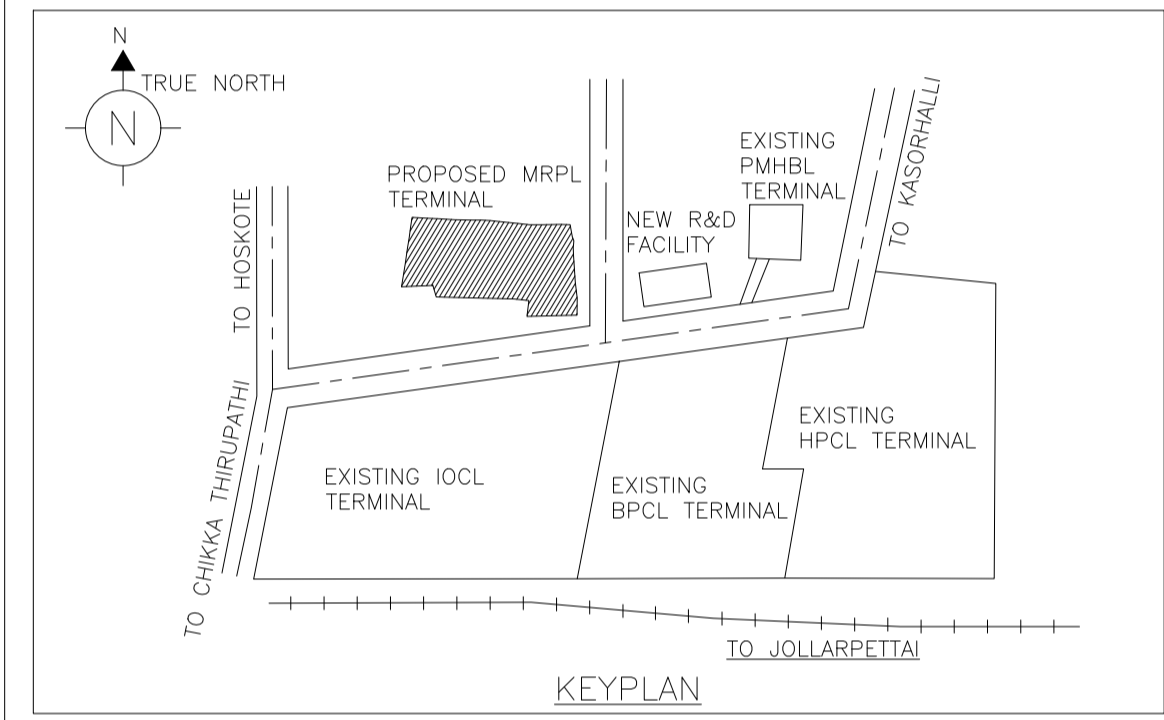
S.NO.	TAG NO.	SERVICE	NO. OF PUMPS
1	GA-A-12A/B/C/D/E/F	FIRE WATER	6 (4W+2S)
2	GA-A-13A/B (JOCKEY)	FIRE WATER	2(1W+1S)
3	GA-A-14A/B (SCREW TYPE)	FOAM	2(1W+1S)
4	GA-A-14C/D (CENTRIFUGAL)	FOAM	2(1W+1S)

TAG NO.	DESCRIPTION	SIZE (M) NOTE-3
1	ARCH	25 x 3 x 10(H)
2	MAIN SECURITY CABIN	3 x 3
3	PLANNING ROOM	14 x 5
4	DG SHED	25 x 10 x 2H
5	SEWAGE TREATMENT PLANT-1(STP) & SUMP & PUMPS	10 x 6
6	WARE HOUSE + MAINTENANCE AREA	26 x 7
7	MCC + TRANSFORMER	45 x 15
8	BESCOM TARIFF METERING YARD	6 x 7
9	ADMIN BUILDING + AMENITY + CONTROL ROOM(G+1) + LABORATORY ROOM+OCCUPATIONAL HEALTH CENTRE	30 x 20
10	SECURITY CABIN (3 nos.)	3 x 3
11	TT LOCK & UNLOCK SHED / SURPRISE CHECK	17 x 10
12	TLF GANTRY-1	52 x 12 (8BAYS)
13	PLT MANIFOLD	10 x 5
14	TLD AREA (UNLOADING ETHANOL & BIO-DIESEL/SICK)	10 x 16
15	TLF PUMP HOUSE (INCLUDING MS & HSD ADDITIVE TANKS & PUMPS)	70 x 5
16	VAPOR RECOVERY UNIT	13 x 5
17	CORROSION INHIBITOR SKID	2 x 5
18	ANTISTADIS/ANTIOXIDANT	1 x 5
19	TLF GANTRY-2	52 x 12 (2BAYS + 6 FUTURE)
20	SAMPLING ROOM	7 x 2
21	TROLLEY MOUNTED METER PROVER SYSTEM	3 x 5 x 2H
22	TT CALIBRATION SHED (DUAL BAY) + SUMP	9 x 12 + 6 x 5 (SUMP)
23	FIRE WATER PUMP HOUSE + FOAM TANK + FOAM PUMP + FOAM SUMP + AIR COMPRESSOR	40 x 8
24	FIRE WATER SUMP	8 x 5 x 3 DEPTH
25	RAW WATER TREATMENT PLANT + STORAGE	8 x 10
26	VISITOR PARKING + OFFICER PARKING	20 x 4
27	TEMPORARY PORTABLE CABIN (2 FLOOR WITH TT CREW REST ROOM, TOILET, CANTEEN)	-
28	TT PARKING	-
29	TT CHECK SHED	5 x 2
30	OWS	10 x 15
31	EMERGENCY EXIT	-
32	CAR AND TWO WHEELER PARKING	60 x 6

TANK NO	(DIA X HT) M X M	PRODUCT	LICENCE/MAX CAPACITY (KL)	TANK TYPE	CLASS
FB-A-01A	24 x 20	MS	9000	IFRVT	A
FB-A-01B	24 x 20	MS	9000	IFRVT	A
FB-A-01C	24 x 20	MS	9000	IFRVT	A
FB-A-02A	24 x 20	HSD	9000	CRVT	B
FB-A-02B	24 x 20	HSD	9000	CRVT	B
FB-A-02C	24 x 20	HSD	9000	CRVT	B
FB-A-02D	24 x 20	HSD (FUTURE)	9000	CRVT	B
FB-A-03A	24 x 20	ATF	9000	CRVT	B
FB-A-03B	24 x 20	ATF	9000	CRVT	B
FB-A-03C	24 x 20	ATF	9000	CRVT	B
FB-A-04A	9 x 9	BIO-DIESEL	575	CRVT	B
FB-A-04B	9 x 9	BIO-DIESEL	575	CRVT	B
FB-A-05A	10 x 15	INTERFACE	1150	CRVT	B
FB-A-06A	9.0 x 9.0	ETHANOL	575	CRVT	A
FB-A-06B	9.0 x 9.0	ETHANOL	575	CRVT	A
FB-A-07A	22 x 14	FIRE WATER	5300	CRVT	-
FB-A-07B	22 x 14	FIRE WATER	5300	CRVT	-
FB-A-08A	2.75 x 13.0 LG	SLOP	77	UG HOR.	A
FB-A-09A	2.75 x 13.0 LG	MS	77	UG HOR.	A
FB-A-10A	2.75 x 13.0 LG	HSD	77	UG HOR.	B
FB-A-11A	1.8 x 3.5	FOAM	VER.	VER.	-
FB-A-11B	1.8 x 3.5	FOAM	7	VER.	-
FB-A-12A	-	MS ADDITIVE	0.9	VER. CYL. CONE BOTTOM	-
FB-A-12B	-	HSD ADDITIVE	0.9	VER. CYL. CONE BOTTOM	-
FB-A-13	-	CORROSION INHIBITOR	0.5	VER. CYL. CONE BOTTOM	-
FB-A-16A	-	ANTIOXIDANT ADDITIVE	0.5	VER. CYL. CONE BOTTOM	-
FB-A-16B	-	STADIS-450 ADDITIVE	0.5	VER. CYL. CONE BOTTOM	-
FB-A-16C	-	LUBRICITY ADDITIVE	0.5	VER. CYL. CONE BOTTOM	-
FB-T-18	-	METER BROWING (ALL PRODUCTS)	5	VER. CYL. CONE BOTTOM	-
FB-A-20	-	RECYCLED WATER	5	RECTANGULAR (VTA)	-
FB-A-21	-	RECYCLED WATER	2	RECTANGULAR (VTA)	-
FB-A-22	-	RECYCLED WATER	1	RECTANGULAR (VTA)	-
FB-A-23	-	RECYCLED WATER	0.5	VTA	-

Sr. No.	Facility	Sr.No.	1	2	3	4	5	6	7	8	9	10
1	Control room And Admin	x										
2	Class-A Tank (MS Tank)		162.5 (60.00)	13 (10.00)	35 (30.00)	34 (30.00)	110 (30.00)	182.3 (60.00)	80 (20.00)	71 (8.00)	70 (50.00)	200 (60.00)
3	Class-B Tank (HSD Tank)		168.3 (45.00)	35 (30.00)	13.00 (10.00)	94 (30.00)	67 (30.00)	132.6 (60.00)	24 (20.00)	30 (8.00)	140.2 (50.00)	194.2 (30.00)
4	Class-B Tank (ATF tanks)		105 (45.00)	34 (30.00)	94 (30.00)	18 (10.00)	72 (30.00)	169.7 (60.00)	20.7 (20.00)	40.8 (8.00)	87.3 (50.00)	146.2 (30.00)
5	Tank Lorry Filling Gantry		45 (45.00)	110 (30.00)	67 (30.00)	72 (30.00)	x	60 (60.00)	44.3 (20.00)	34.7 (8.00)	26.5 (50.00)	72.8 (30.00)
6	Fire pump house		126.4 (12.00)	182.3 (60.00)	132.6 (60.00)	169.7 (60.00)	60 (60.00)	x	14 (00.00)	100.80 (8.00)	343.3 (50.00)	126.3 (6.00)
7	Boundary wall around installation		22 (6.00)	80 (20.00)	24 (20.00)	20.7 (20.00)	44.3 (20.00)	14 (00.00)	x	38.3 (6.00)	15 (15.00)	15.1 (15.00)
8	Product Pump House		86.6 (30.00)	71 (8.00)	30 (8.00)	40.8 (8.00)	34.7 (8.00)	100.80 (6.00)	38.3 (6.00)	x	227 (30.00)	121.6 (30.00)
9	Oil Water Sperator		298 (30.00)	70 (50.00)	140.2 (50.00)	87.3 (50.00)	26.5 (50.00)	343.3 (50.00)	15 (15.00)	227 (30.00)	x	340 (45.00)
10	Electrical substation		13.3 (00.00)	200 (60.00)	194.2 (30.00)	146.2 (30.00)	72.8 (30.00)	126.3 (6.00)	15.1 (15.00)	121.6 (30.00)	340 (45.00)	x

All the distances are in Metres.



SL.NO	REV.	TITLE
3	-	TOPOGRAPHICAL SURVEY OF LAND FOR MRPL
2	MRPL-DEV-PR-LY-101	10 GENERAL LAYOUT
1	3997-31-16-47-1432	0 OVER ALL PLOTPLAN B'LORE RECEIVING TERMINAL

SL.NO	REV.	TITLE
1	10-MAR-21	RE-ISSUED FOR BID
0	09-MAR-21	ISSUED FOR BID
C2	8-DEC-20	ISSUED FOR APPROVAL
C1	23-NOV-20	ISSUED FOR APPROVAL

CLIENT: **ONGC 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: **OVERALL PLOT PLAN**

CLIENT TENDER No: 320000428 | DRAWING No: 20005-GEN-L-DW-3001 | SHT NO. 1 OF 1 | REV 1 | SCALE: 1:1

## NOTES

**EARTHWORKS**

- EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH SPECIFICATION DOC NO. 20005-GEN-S-SPE-2012.
- FOR SOIL SUPPORTED FOUNDATION THE EXPOSED SOFT SUBGRADE SHOULD BE REMOVED. LEAN CONCRETE 1:5:10 CAN BE USED TO MAKEUP ANY EXCESS EXCAVATION.

**GENERAL R.C.C WORKS**

- THE 20005-GEN-S-RPT-2101 SHALL BE USED IN CONJUNCTION WITH THIS GENERAL NOTES AND THE DESIGN DRAWINGS FOR CONCRETE CONSTRUCTION.
- ALL CONCRETE SHALL BE GRADE M30 @ 28 DAY TEST, UNLESS NOTED ON THE DRAWING. THE MAXIMUM ALLOWABLE WATER-CEMENT RATIO SHALL NOT EXCEED 0.55 FOR NORMAL FOUNDATION AND STRUCTURES AND 0.45 FOR FOUNDATIONS NEAR THE SEA SHORE UNLESS NOTED. CEMENT CONTENT SHALL NOT BE LESS THAN 375 Kg PER CUBIC METER.
- MAXIMUM SIZE OF COARSE AGGREGATE SHALL BE 20mm FOR ALL CONCRETE WORKS. EXCEPT FOR SOLING WORKS.
- FOR ABOVE GROUND CONCRETE STRUCTURES CEMENT SHALL BE 53 GRADE ORDINARY PORTLAND CEMENT CONFORMING TO IS:12269.
- CHAMFER EXPOSED CONCRETE EDGES 20 TO 25 mm AT 45 DEGREES.
- REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO INDIAN STANDARD IS:1786, STRENGTH GRADE Fe500. BARS SHALL BE BENT COLD. WELDING (INCLUDING TACK WELDING) OF REINFORCING BARS IS STRICTLY PROHIBITED UNLESS OTHERWISE SHOWN AND NOTED.
- CONCRETE SURFACES TO RECEIVE GROUT AND INTERFACES BETWEEN NEW CONCRETE AND PREVIOUSLY HARDENED CONCRETE SHALL BE CLEAN AND FREE FROM LAITANCE AND SHALL BE ROUGHED TO PROVIDE A COATING OF CEMENT SLURRY OR APPROVED BONDING CHEMICAL BEFORE PLACING NEW CONCRETE.
- ALL FOUNDATION SHALL BE PREFERABLY IN PLACE BEFORE INSTALLING UNDERGROUND PIPING OR ELECTRICAL CABLES EXCEPT AS NOTED ON DESIGN DRAWINGS. ALL UNDERGROUND PIPING AND ELECTRICAL CABLE EXCEPT AS NOTED ON DESIGN DRAWINGS.
- SLABS FOR SKID FOUNDATIONS OR ANY FOUNDATION NOT REQUIRING GROUT SHALL BE POURED SMOOTH TRUE AND LEVEL THE TOP SURFACE LEVEL TOLLERANCE SHALL BE +/- mm IN ANY 3 m DIMENSION FROM THE SPECIFIED ELEVATION.
- BLINDING CONCRETE 50mm MINIMUM THICKNESS SHALL BE USED UNDER FOUNDATIONS AND PAVING SLAB UNLESS NOTED OTHERWISE.
- BEFORE PLACING CONCRETE CONTRACTOR SHALL VERIFY ANY REQUIREMENTS OF ANY RELEVANT SERVICES, EMBEDDED ITEMS, BOLTS, HOLES, POCKETS ETC AS PER DESIGN DRAWINGS.
- NO CONSTRUCTION JOINTS IN POSITION OTHER THAN SHOWN IN THE DRAWINGS SHALL BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.
- WELDING OF REINFORCEMENT WILL NOT TO BE PERMITTED UNLESS OTHERWISE APPROVED BY ENGINEER.
- ALL DOWEL BARS & LAPS SHALL HAVE LAP LENGTH OF 50 TIMES DIA OF THE BAR AND CONFORMING TO IS:13920-1993 UNLESS NOTED OTHERWISE ON DRAWINGS. ALL LAPS SHALL BE STAGGERED WITH A GAP OF 300mm BETWEEN LAPS.
- HOOKS SPLICES OF REINFORCEMENT SHALL BE MADE AS SHOWN ON THE DRAWING OR AS APPROVED FOR ENGINEER.
- REINFORCING BAR BENDING AND FIXING SHALL BE AS DEFINED IN INDIAN STANDARD IS:2502.
- MINIMUM COVER TO REINFORCEMENT SHALL BE AS MENTIONED IN THE BELOW TABLE FOR TWO HOUR FIRE RESISTANCE.

SL. NO.	DESCRIPTION	MIN COVER	COVER FOR FACES ON CONTACT WITH SOIL
1.	CAST-IN-SITU CONCRETE SLABS (ROOF & FLOOR) INCLUDING CHAJA, STAIRCASE	25	30MM OR DIA OF BAR OF WHICHEVER IS GRATER
2.	BEAM (ROOF, FLOOR, TIE & PLINTH BEAM), LINTEL	35	50 MM
3.	COLUMN, PEDESTAL	40	55 MM
4.	FOUNDATION SLAB, PILE CAP, BASE SLAB PLINTH BEAM.	50	65 MM
5.	GRADE SLAB.	25	40 MM
6.	MASS CONCRETE FOUNDATION	50	75 MM
7.	CABLE TRENCHES	40	55 MM
8.	PILE CAP BOTTOM	50	100 MM

- EMBEDDED PLATES AND OTHER SECTIONS SHALL CONFORM TO IS:2266/IS2062 EMBEDDED PLATES SHALL BE SUITABLY ANCHORED WITH LUGS WELDED TO THEM.
- LAPPING SHALL 50 TIMES THE DIA OF BAR OR AS PER IS:456.
- GROUTING SHALL BE DONE AS PER SPECIFICATION NO. 20005-GEN-S-SPE-2009
- ANCHOR BOLTS SHALL BE PROVIDED AS PER SPECIFICATION NO. 20005-GEN-S-SPE-2009

**ARCHITECTURAL**

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS NOTED OTHERWISE.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT REINFORCED CONCRETE CONCRETE DRAWINGS, STRUCTURAL STEEL DRAWINGS, SERVICE DRAWINGS, OTHER DRAWINGS, CONTRACT TERMS & CONDITIONS, SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS ON SITE BEFORE FABRICATION AND CONSTRUCTIONS OF STRUCTURAL STEEL WORK.
- RESPECTIVE ARCHITECTURAL DRAWINGS SHALL BE REFERRED TO FOR ARCHITECTURAL FINISHES.
- DAMP PROOF COURSE TO CONFORM TO 20005-GEN-S-SPE-2004-MASONRY SPECIFICATION.
- BLINDING CONCRETE 150 THK. (C15) TYPE SHALL BE PROVIDED UNDER ALL MASONRY WALL FOUNDATIONS.
- VAPOUR BARRIER WITH BITUMINOUS SPRAY 150mm THK. SHALL BE PROVIDED FOR ALL GROUND STRUCTURES.
- WATER PROOFING OF ROOFS SHALL BE IN ACCORDANCE WITH THE DETAILS SPECIFIED IN THE ARCHITECTURAL DRAWINGS
- WELL COMPACTED STRUCTURAL FILL SHALL BE PLACED UP TO A DEPTH OF 300mm BELOW FINISHED GRADED LEVEL IN PLINTH PROTECTION AREAS AROUND THE BUILDING.

**FORM WORKS**

- THE SHUTTERING OF CANTILEVER MEMBERS SHALL BE REMOVED, AFTER SHUTTERING OF ITS SUPPORTING MEMBERS HAS BEEN REMOVED. ON REMOVAL OF FORM WORK, ALL CONCRETE SURFACES SHALL BE CLOSELY HACKED TO PROVIDE A ROUGH SURFACE FOR BONDING. FORM WORK SHALL BE PROPERLY SHORED BRACED AND / OR TIED TOGETHER TO MAINTAIN POSMON MID SHAPE DURING CONCRETE PLACEMENT.

**MASONRY WORKS**

- CEMENT MORTAR TO BE SED SHALL BE 1:3 FOR BRICK WALLS UP TO 230mm THICKNESS.
- CEMENT MORTAR 1:4 TO BE USED FOR BLOCK WORK IN VALVE PITS, DRAINS, MANHOLES ETC.
- TOLERANCES FOR ALL MASONRY DIMENSIONS SHALL BE ±10mm.
- MORTARS AND THICKNESS FOR VARIOUS TYPES OF PLASTERING WORK SHALL BE AS FOLLOWS:


PLAIN FACED 13mm THICK 1:4 CEMENT SAND PLASTER	INTERIOR EVEN FACES OF BLOCK WALLS, UNDERSIDE OF SLABS, CANOPIES, STAIRCASES, ETC., ALSO INTERIOR FACES OF RC BEAMS AND COLUMNS.
PLAIN FACED 20mm THICK (2 LAYERS) 1:4 CEMENT SAND PLASTER	INTERIOR UNEVEN FACES OF BLOCK WALLS
PLAIN/SAND FACED 20mm THICK (2 LAYERS) 1:4 CEMENT SAND PLASTER WITH WATER PROOFING COMPOUND, IF REQUIRED.	EXTERNAL FACES OF BLOCK WALLS, RC BEAMS, COLUMNS, ETC. ALSO BOTH FACES OF BLOCK WALLS IN FOUNDATION, WHERE PART OF THE BLOCKWORK MAY BE UNDER WATER TABLE.

- SKIRTING TILES MINIMUM 150mm HEIGHT SHALL BE PROVIDED IN ALL AREAS WITH COLOUR AND MATERIALS MATCHING WITH FLOOR TILES.
- OPENINGS IN BLOCK WALLS FOR SIZES UPTO 100mm DIAMETER ARE NOT INDICATED IN DRAWINGS. THESE OPENING SHALL BE LOCATED AT SITE TO SUIT PIPE LAYOUT.


**LEGEND**

G.I.	GALVANISED IRON
M.S.	MILD STEEL
B.S.	BRITISH STANDARD
R.C.C.	REINFORCED CEMENT CONCRETE
T.O.P.	TOP OF PLATE
T.O.C.	TOP OF CONCRETE
G.L.	GROUND LEVEL
E.G.L.	EXISTING GROUND LEVEL
F.G.L.	FINISHED GROUND LEVEL
F.F.L.	FINISHED FLOOR LEVEL
T.O.S.	TOP OF STEEL

1	11-MAR-21	RE-ISSUED FOR BID	RN	MCM	NR	
0	17-FEB-21	ISSUED FOR BID	RN	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

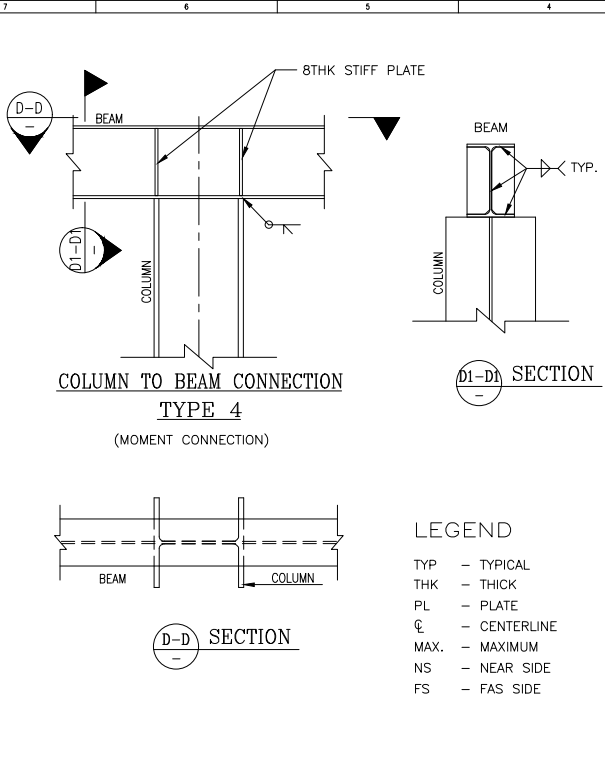
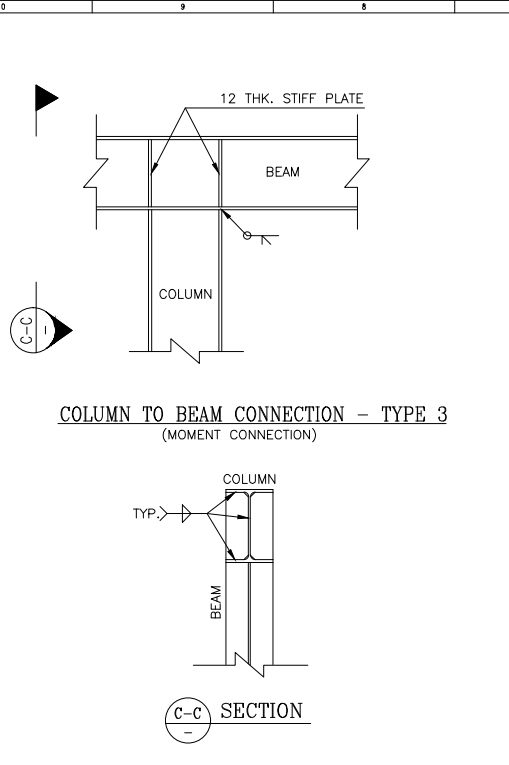
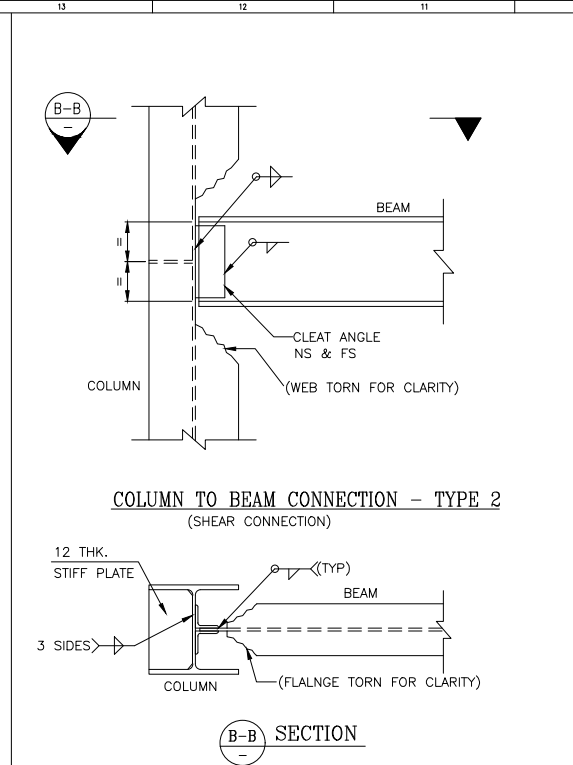
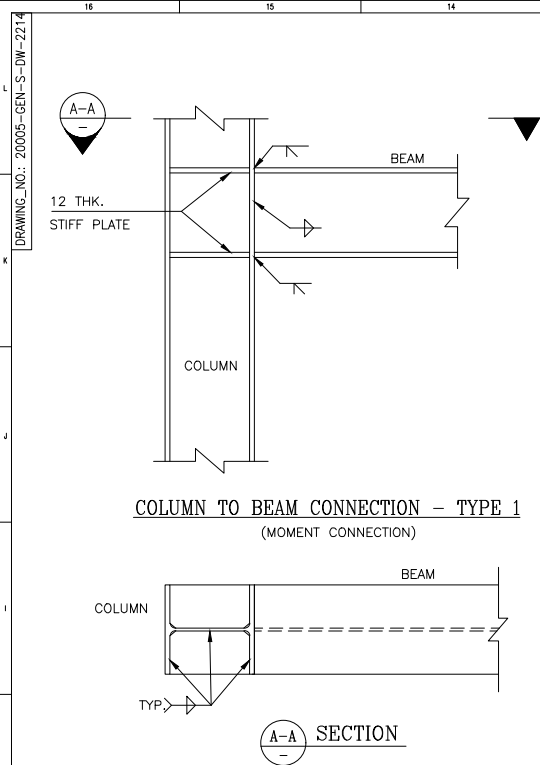
CLIENT:  
 **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT:  
 **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**GENERAL NOTES FOR ARCHITECTURAL AND CONCRETE WORKS**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2201	1 OF 2	1	NTS

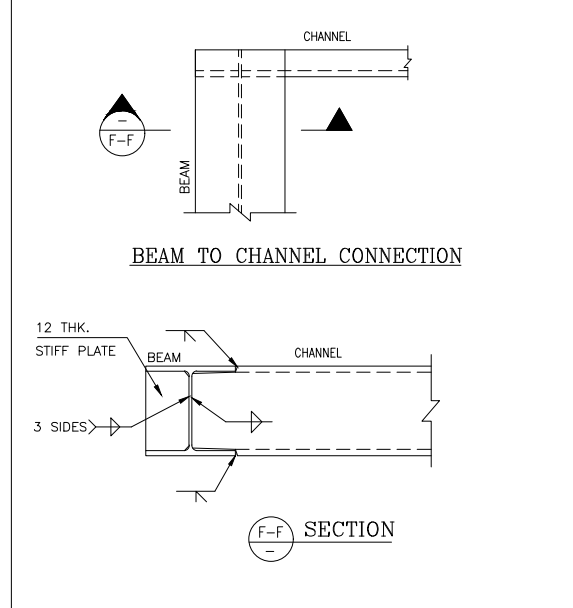
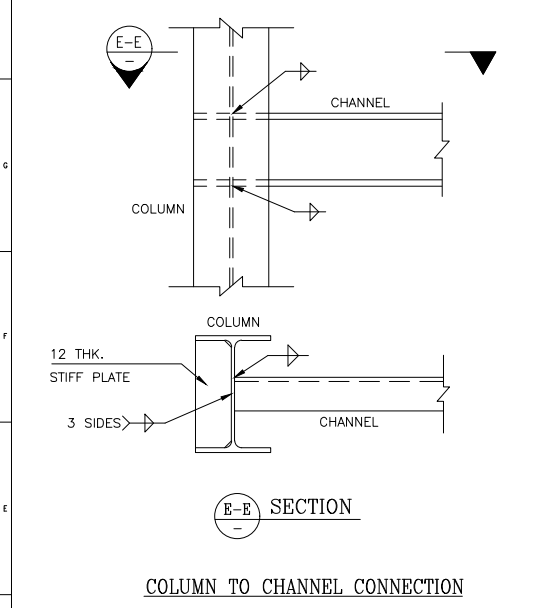


**NOTES**

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS, SPECIFICATIONS & INFORMATION.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
3. MINIMUM FILLET WELD SIZE TO BE 6 mm UNLESS OTHERWISE MENTIONED.

**LEGEND**

TYP - TYPICAL  
THK - THICK  
PL - PLATE  
CL - CENTERLINE  
MAX. - MAXIMUM  
NS - NEAR SIDE  
FS - FAS SIDE



**BEAM TO BEAM CONNECTION (MOMENT CONNECTION)**

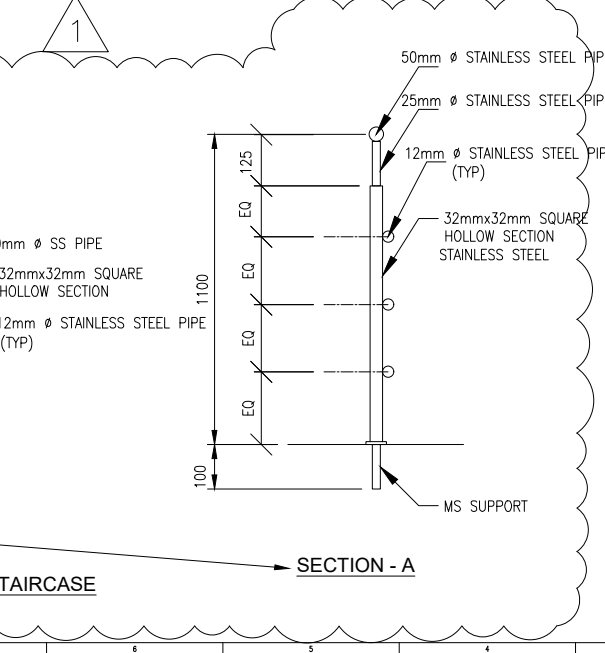
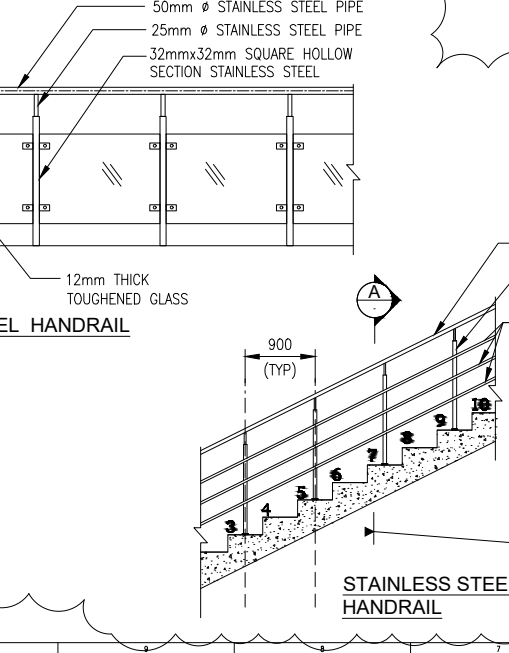
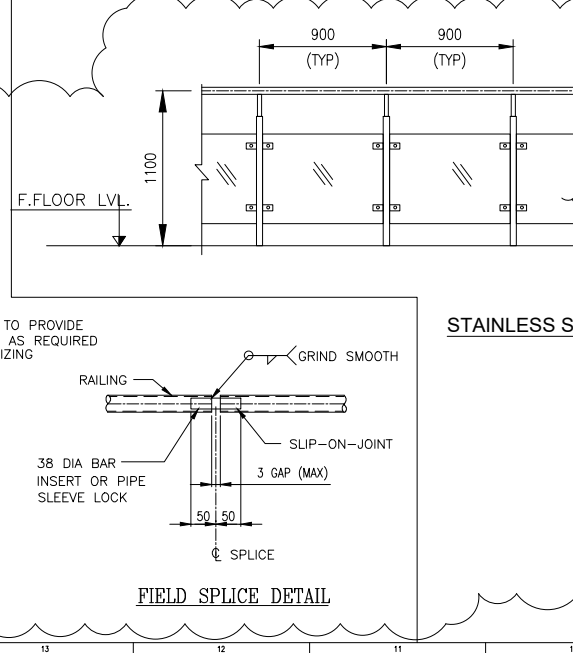
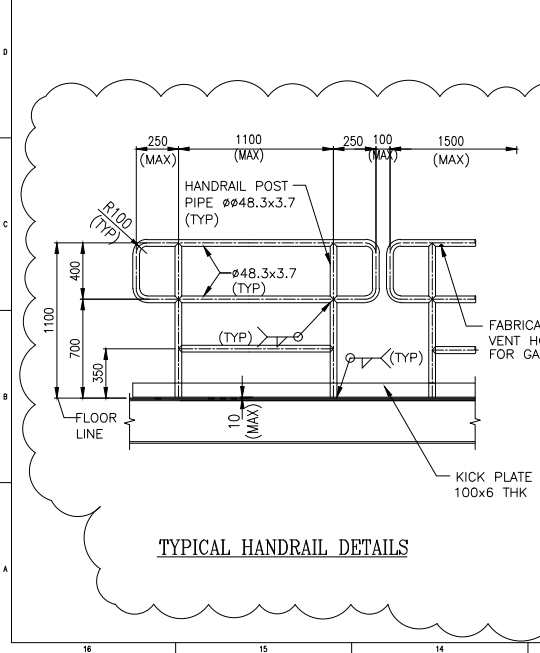
**BEAM TO BEAM CONNECTION (SHEAR CONNECTION)**

**G-G SECTION**

FILLET WELDS TYPICAL U.N.O.	
THK. OF THINNER PLATE AT JOINT	MIN. LENGTH OF FILLET WELD LEG
mm	mm
6 - 15	6
16 - 30	8
32 - 50	10
55 - 80	13

WELD LEG NEED NOT BE GREATER THAN THE THINNER PLATE AT JOINT

**TABLE OF MINIMUM SIZE FOR FILLET WELDS**  
(TO BE USED WHEREVER NO SPECIFIC SIZE IS GIVEN)



REV.	DATE	DESCRIPTION	SKK	MCM	NR	MRPL
1	10-MAR-21	ISSUED FOR BID				
0	17-DEC-20	ISSUED FOR BID	RN	MCM	NR	

CLIENT: **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT: **CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

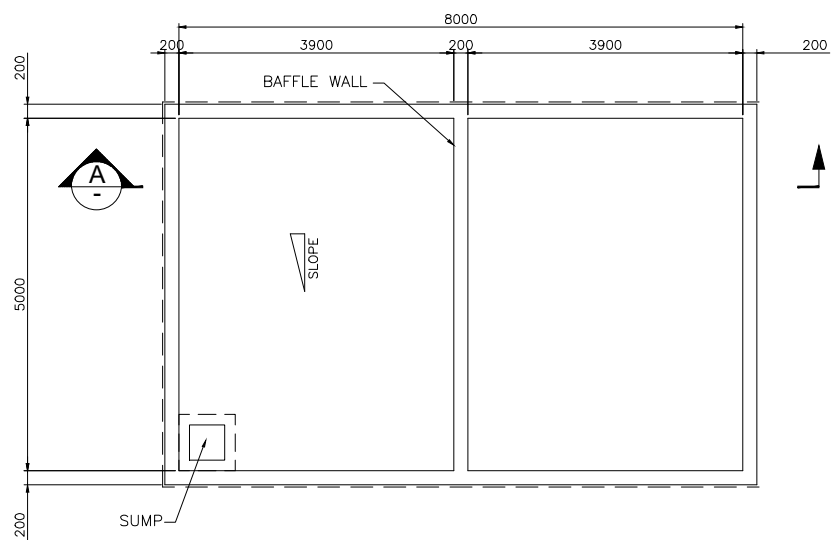
PROJECT MANAGEMENT CONSULTANT: **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE: **STANDARD DETAILS OF STRUCTURAL BEAM CONNECTIONS, HAND RAIL AND WELDING DETAILS**

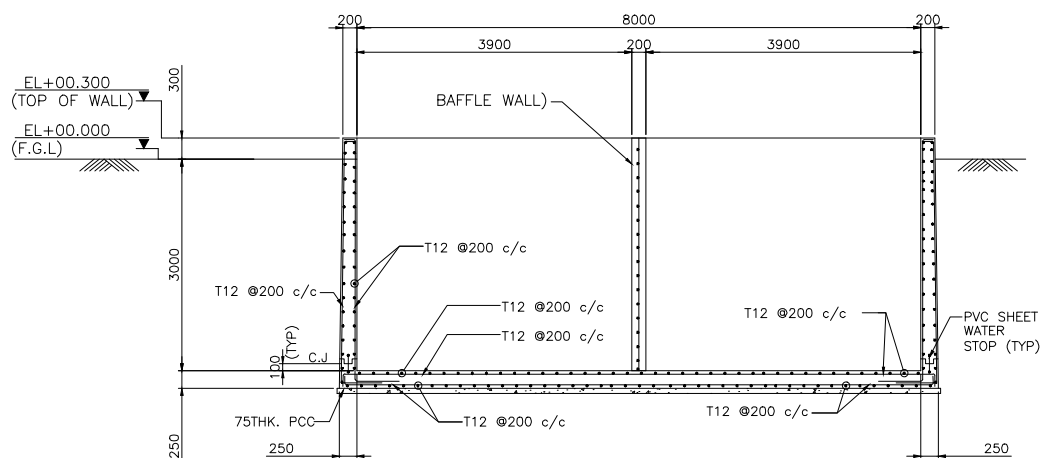
CLIENT TENDER No: 3200000490	DRAWING No: 20005-GEN-S-DW-2214	SHT NO. 1 OF 1	REV 1	SCALE: NTS
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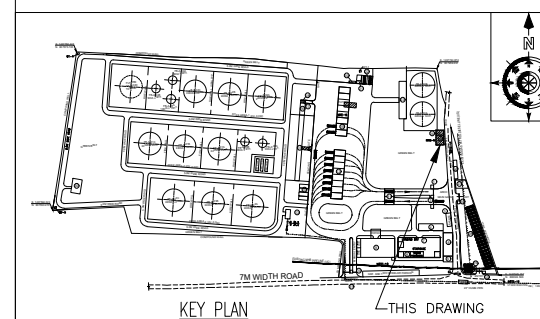
DRAWING NO.: 20005-GEN-S-DW-2303



PLAN

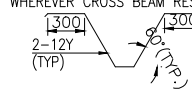
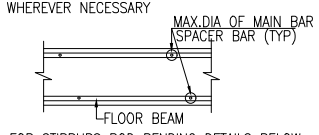
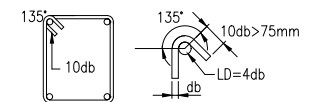


SECTION A-A



KEY PLAN

NOTES :-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
2. GRADE OF CONCRETE SHALL BE M30 UNLESS OTHERWISE SPECIFIED
3. CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :  
 FOR FOOTINGS - 50mm  
 FOR COLUMNS - 40mm AND FOR BEAMS 30mm OR DIA. OF BAR WHICHEVER IS GREATER.  
 FOR SLAB - 20mm OR DIA. OF LARGEST BAR WHICHEVER IS GREATER.
4. 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND
5. LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
6. FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
7. THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
8. (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
9. COL. REINFT. LAPS SHALL BE STAGGERED & TO BE PROVIDED ONLY IN THE CENTRAL HALF OF CLEAR FLOOR TO FLOOR HEIGHT OR TIE BEAMS.
10. TOP BARS IN BEAMS SHALL BE LAPPED WHEREVER NECESSARY AT MID SPAN AND BOTTOM BARS IN BEAMS SHALL BE LAPPED AT ONE THIRD OF SPAN DISTANCE FROM SUPPORT.
11. ALL HOOKS, BENDS AND LAPS SHALL BE AS PER IS 2502-1963 AND IS 13920-1993 U.O.S.
12. U.O.S DENOTES UNLESS OTHERWISE SPECIFIED.
13. PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.  

14. PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY  

15. FOR STIRRUPS ROD BENDING DETAILS BELOW  

16. MIN. SAFE BEARING CAPACITY OF SOIL AT 2.0M BELOW FGL CONSIDERED AS 25.0 T/sq.m.
17. ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	18-JAN-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

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.**

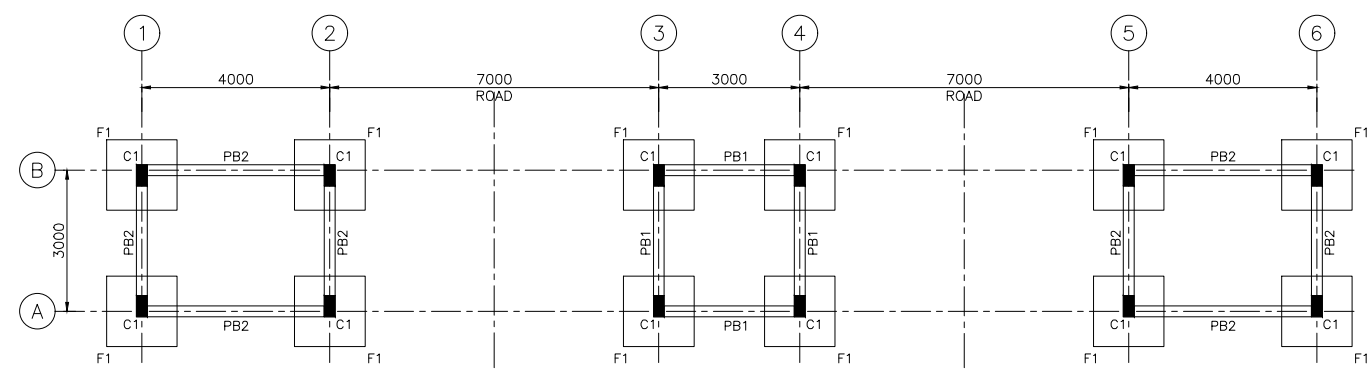
DRAWING TITLE:  
**RCC DETAIL FOR UNDER GROUND TANK FOR FIRE WATER SUMP**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2303	1 OF 1	1	1:50

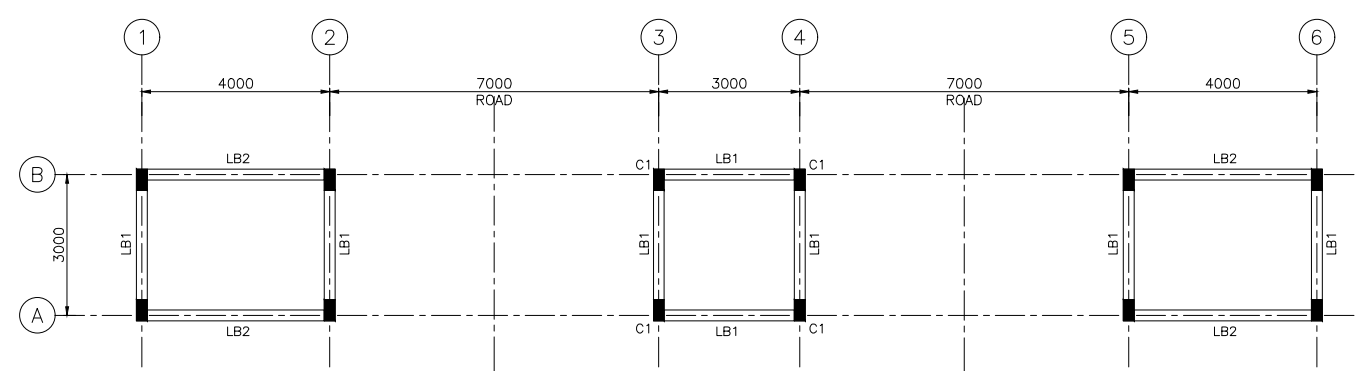
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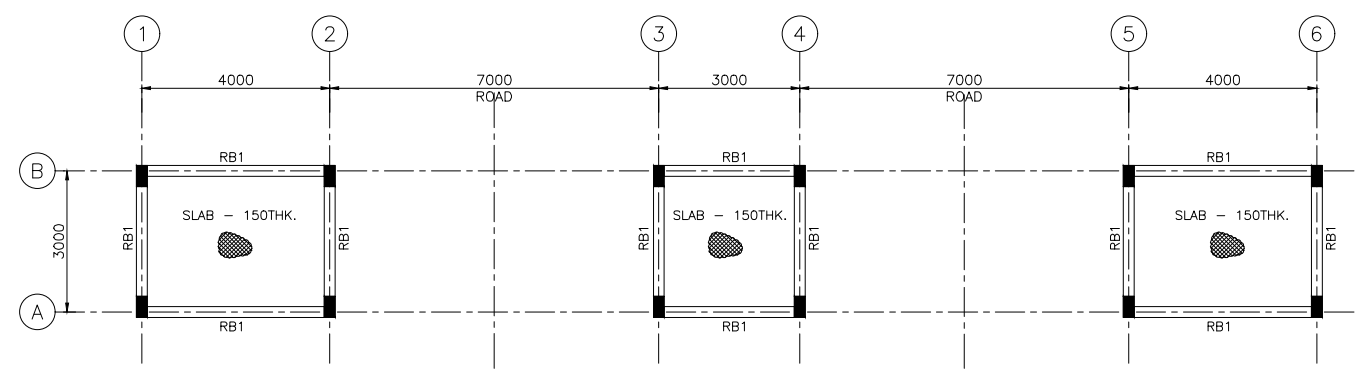
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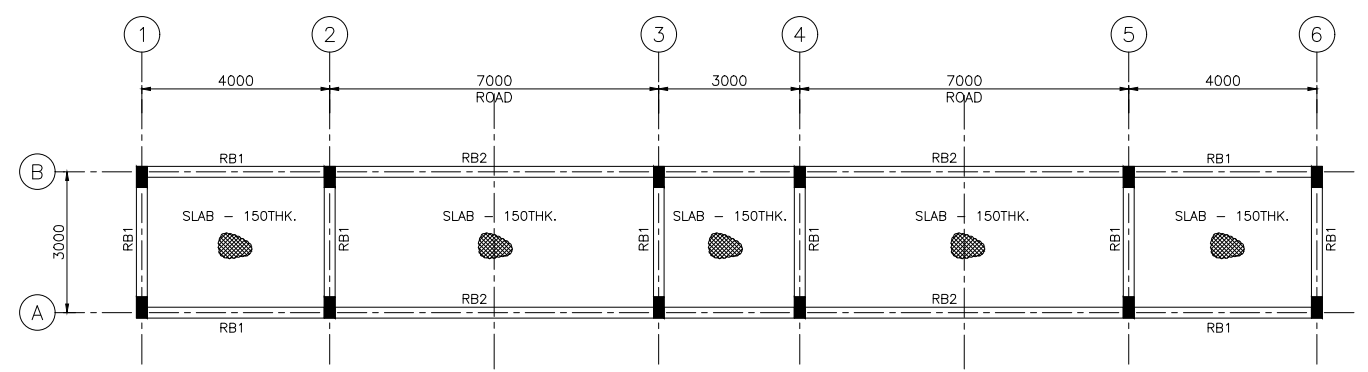
**FOUNDATION/GRADE BEAM PLAN**



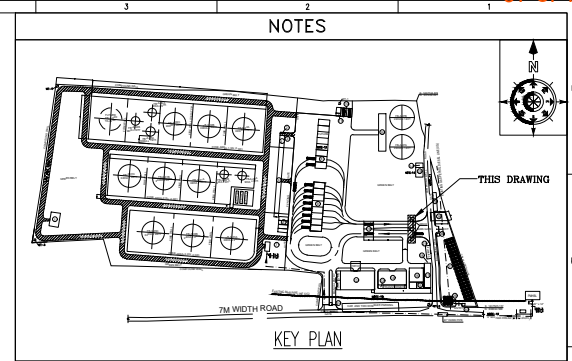
**LINTEL BEAMS**



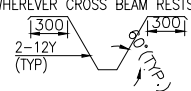
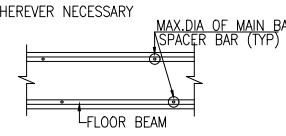
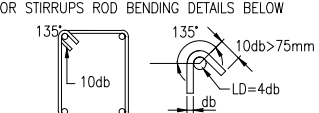
**RCC SLAB PLAN AT EL. +3.35M**



**RCC SLAB PLAN AT EL. +11.30M**



**KEY PLAN**

- NOTES :-**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
  - GRADE OF CONCRETE SHALL BE (M30) UNLESS OTHERWISE SPECIFIED
  - CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :  
 FOR FOOTINGS - 50mm  
 FOR COLUMNS - 40mm AND FOR BEAMS 30mm OR DIA. OF BAR WHICHEVER IS GREATER.  
 FOR SLAB - 20mm OR DIA. OF LARGEST BAR WHICHEVER IS GREATER.
  - 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND
  - LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
  - FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
  - THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
  - (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
  - COL. REINF. LAPS SHALL BE STAGGERED & TO BE PROVIDED ONLY IN THE CENTRAL HALF OF CLEAR FLOOR TO FLOOR HEIGHT OR TIE BEAMS.
  - TOP BARS IN BEAMS SHALL BE LAPPED WHEREVER NECESSARY AT MID SPAN AND BOTTOM BARS IN BEAMS SHALL BE LAPPED AT ONE THIRD OF SPAN DISTANCE FROM SUPPORT.
  - ALL HOOKS, BENDS AND LAPS SHALL BE AS PER IS 2502-1963 AND IS 13920-1993 U.O.S.
  - U.O.S DENOTES UNLESS OTHERWISE SPECIFIED.
  - PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.  

  - PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY  

  - FOR STIRRUPS ROD BENDING DETAILS BELOW  

  - MIN. SAFE BEARING CAPACITY OF SOIL AT 2.0M BELOW FGL CONSIDERED AS 25.0 T/sq.m.
  - ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR
0	25-JAN-21	ISSUED FOR BID	SKK	MCM	NR
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD
			NAU		MRPL

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.**

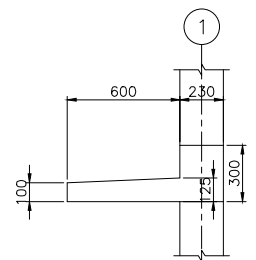
DRAWING TITLE:  
**MAIN SECURITY CABIN AND S&D ROOM SCHEMATIC PLAN**

**REFERENCE DRAWING:**  
 1. DRAWING NO.:- 20005-GEN-S-DW-2304, SH-1 OF 3  
 20005-GEN-S-DW-2304, SH-3 OF 3

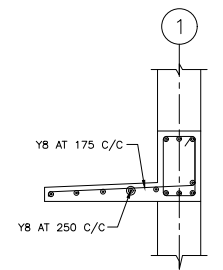
CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
320000490	20005-GEN-S-DW-2304	2 OF 3	1	1:75

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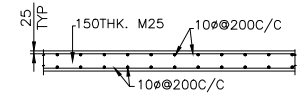
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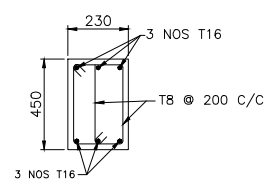
SECTION E-E



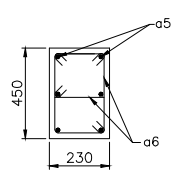
RC DETAIL OF SECTION A-A



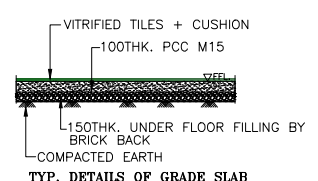
REINFORCEMENT DETAIL OF RCC ROOF SLAB



ROOF BEAM (N.T.S.)



SECTION 'S1-S1' (N.T.S.)



TYP. DETAILS OF GRADE SLAB

SCHEDULE OF FOOTING

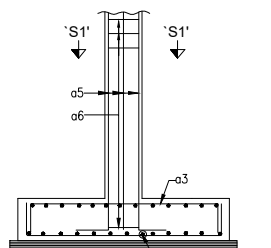
SL. NO.	FOOTING MARKED	A	B	E	REINFORCEMENT STEEL			
					a1	a2	a3	a4
1	F1	2000	2000	450	T12@125 C/C	T12@125 C/C	T16@200 C/C	T12@150 C/C

SCHEDULE OF COLUMN

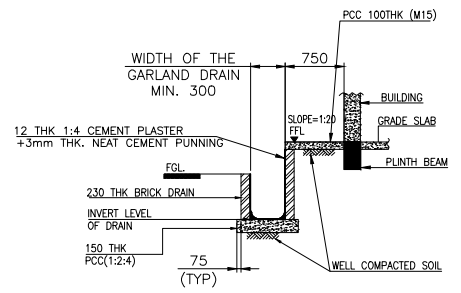
SL. NO.	COLUMN MARKED	C	D	MAIN STEEL-a5	STIRRUPS a6	REMARK
1	C1	450	230	6-T25	T8@200 C/C	-

SCHEDULE OF BEAM

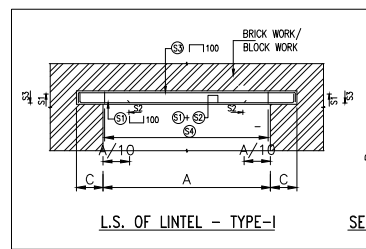
SL. NO.	BEAM MARKED	H	D	BOTTOM STEEL	TOP STEEL	STIRRUPS	REMARK
1	PB1	230	450	3-T16	3-T16	T8@200 C/C	-
2	PB2	230	650	3-T16	3-T16	T8@200 C/C	-
3	RB1	230	450	3-T16	3-T16	T8@200 C/C	-
4	RB2	230	650	3-T16	3-T16	T8@200 C/C	-
5	LB1	230	300	3-T16	3-T16	T8@200 C/C	-
6	LB2	230	300	3-T16	3-T16	T8@200 C/C	-



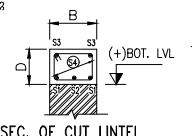
FOOTING (REINFORCEMENT DETAILS)



TYP. DETAIL OF PLINTH PROTECTION DETAIL (N.T.S.)



L.S. OF LINTEL - TYPE-I



SEC. OF CUT LINTEL

SCHEDULE OF LINTEL BEAMS FOR PARTITION WALLS

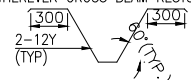
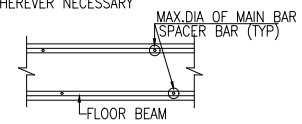
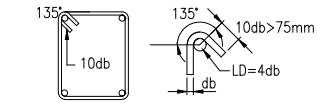
BEAM No	OPENING WIDTH A	MIN. BEARING WIDTH C	BEAM SIZE				REINFT. DETAILS				LVL
			B	D	S1	S2	S3	S4			
LB1/LB2	901 TO 1200	150	115	150	2-Y12	-	2-Y12	RB AT 125C/C	+2.200		

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS AND COORDINATES ARE IN METERS UNLESS NOTED OTHERWISE.
2. FOR ALL OTHER NOTES REFER SHEET-1

**LEGEND:**

- F.F.L. - FINISHED FLOOR LEVEL
- F.G.L. - FINISHED GROUND LEVEL
- T.O.S. - TOP OF STRUCTURE
- T.O.G. - TOP OF GROUT
- P.L. - PROJECTED LENGTH
- T.L. - THREADED LENGTH
- T.O.C. - TOP OF COLUMN

**NOTES :-**

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
2. GRADE OF CONCRETE SHALL BE M30 UNLESS OTHERWISE SPECIFIED
3. CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :
  - FOR FOOTINGS - 50mm
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4. 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND
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7. THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
8. (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
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12. U.O.S DENOTES UNLESS OTHERWISE SPECIFIED.
13. PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.
 
14. PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY
 
15. FOR STIRRUPS ROD BENDING DETAILS BELOW
 
16. MIN. SAFE BEARING CAPACITY OF SOIL AT 2.0M BELOW FGL CONSIDERED AS 25.0 T/sq.m.
17. ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

**REFERENCE DRAWING:**

1. DRAWING NO.: 20005-GEN-S-DW-2304, SH-1 OF 3
- 20005-GEN-S-DW-2304, SH-2 OF 3

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	25-JAN-21	ISSUED FOR BID	SKK	MCM	NR	

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:



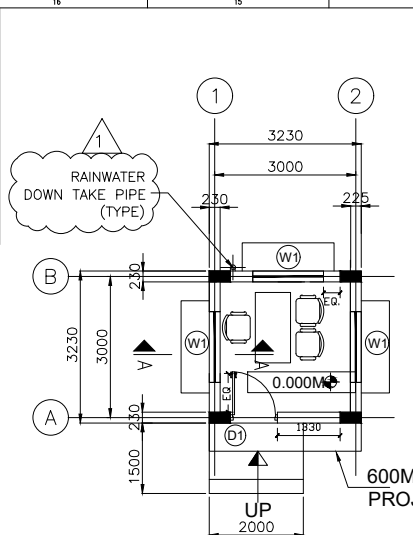
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE: **MAIN SECURITY CABIN AND S&D ROOM SCHEMATIC PLAN**

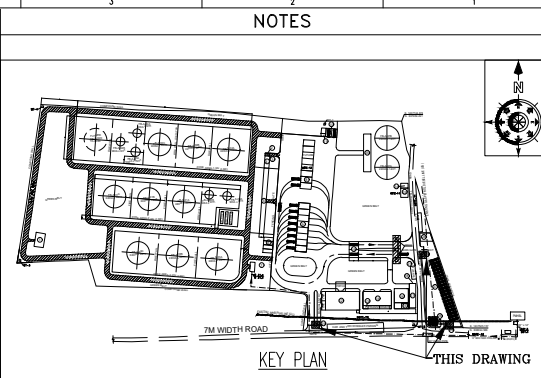
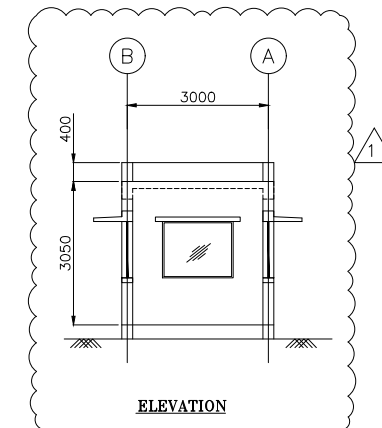
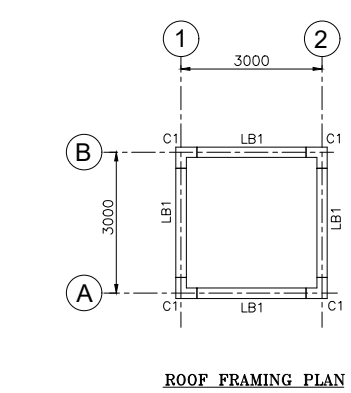
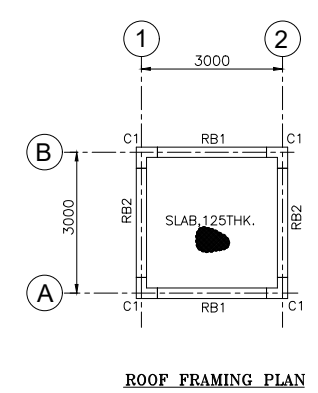
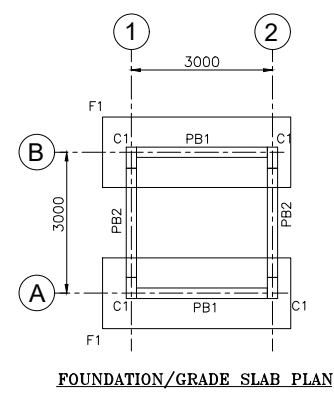
CLIENT TENDER No: 3200000490	DRAWING No: 20005-GEN-S-DW-2304	SHT NO. OF 3 3 OF 3	REV 1	SCALE: 1:75
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DRAWING NO.: 20005-GEN-S-DW-2310



1	D1	900	2200	WOODEN FRAME WITH PRE LAMINATED FLUSH DOOR
2	W1	1800	1200	ALUMINUM FRAME WITH SLIDING GLASS PANELS



NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS AND COORDINATES ARE IN METERS UNLESS NOTED OTHERWISE.
- CONCRETE GRADE OF C30 FOR SLAB, COLUMN PEDESTAL /FOOTING SHALL BE USED.
- EVERY METAL COMPONENT OF THE FOUNDATION SHALL ENSURE ELECTRICAL CONTINUITY TO GROUND.
- FGL 100.0 CORRESPONDS TO FGL LEVEL SHOWN IN THE SITE GRADING DRAWINGS. THE LOCATION OF THE BUILDING SHALL BE AS PER PLOT PLAN.
- THE COMPACTED (95% MDD) SELECT FILL (MURRUM) SHALL BE USED BETWEEN FGL & NGL. UNLESS NOTED OTHERWISE.
- ALL REINFORCEMENT SHALL BE HIGH STRENGTH DEFORMED STEEL BARS OF GRADE Fe 500 CORROSION RESISTANT CONFORMING TO IS 1786 SHALL BE USED.
- MIN. SAFE BEARING CAPACITY AT 2.0M DEPTH SHALL BE 75t/m<sup>2</sup>
- GRADE SLAB SHALL BE CONSTRUCTED MONOLITHIC WITH PLINTH BEAMS. PLINTH PROTECTION ALSO MONOLITHIC WITH PLINTH BEAMS.
- THE GARLAND DRAIN SHOWN IN INDICATIVE ONLY. SITE TO DECIDE THE EXACT LOCATION AND DRAIN TYPE(OPEN OR UNDER GROUND) AS PER THE LAYOUT REQUIREMENT.
- ALL DETAILS SHOWN IN THE DRAWING ARE INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

- LEGEND:**
- F.F.L. - FINISHED FLOOR LEVEL
  - F.G.L. - FINISHED GROUND LEVEL
  - T.O.S. - TOP OF STRUCTURE
  - T.O.G. - TOP OF GROUT
  - P.L. - PROJECTED LENGTH
  - T.L. - THREADED LENGTH
  - T.O.C. - TOP OF COLUMN

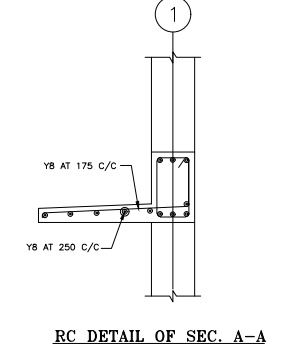
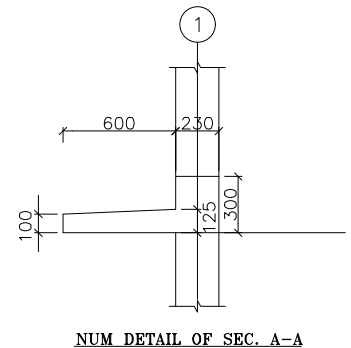
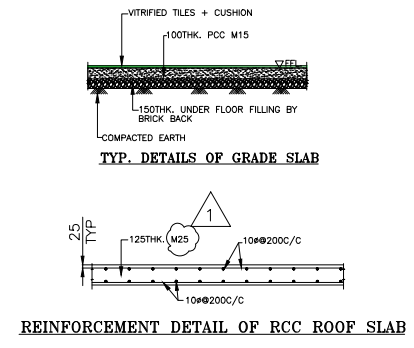
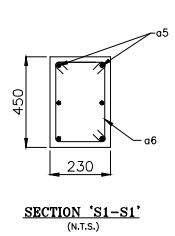
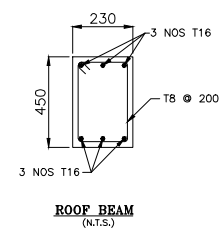
EMERGENCY GATE SECURITY CABIN GROUND FLOOR PLAN

FOUNDATION/GRADE SLAB PLAN

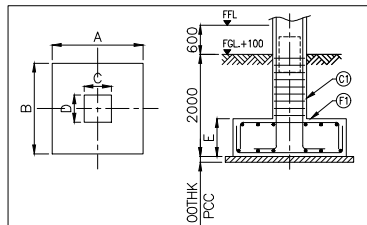
ROOF FRAMING PLAN

ROOF FRAMING PLAN

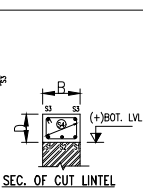
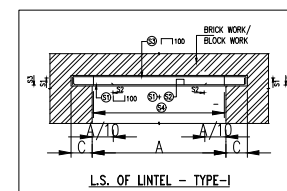
ELEVATION



SCHEDULE OF FOOTING



SL. NO.	FOOTING MARKED	A	B	E	REINFORCEMENT STEEL			
					o1	o2	o3	o4
1	F1	1500	4000	450	T12@125 C/C	T12@125 C/C	T16@200 C/C	T12@150 C/C



SCHEDULE OF LINTEL BEAMS FOR PARTITION WALLS

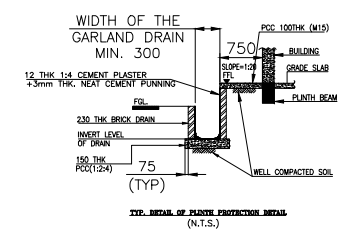
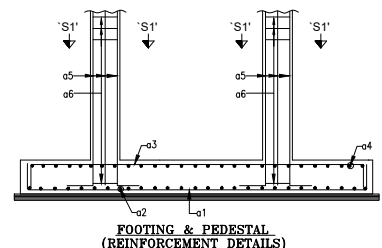
BEAM No	OPENING WIDTH A	MIN. BEARING WIDTH C	BEAM SIZE		REINFT. DETAILS				LVL.
			B	D	S1	S2	S3	S4	
LB1	901 TO 1200	150	115	150	2-Y12	-	2-Y12	RB AT 125C/C	+2.200

SCHEDULE OF COLUMN

SL. NO.	COLUMN MARKED	C	D	MAIN STEEL-o5	STIRRUPS o6	REMARK
1	C1	450	230	6-T25	T8@200 C/C	-

SCHEDULE OF BEAM

SL. NO.	BEAM MARKED	H	D	BOTTOM STEEL	TOP STEEL	STIRRUPS	REMARK
1	PB1	230	450	3-T16	3-T16	T8@200 C/C	-
2	PB2	230	550	3-T16	3-T16	T8@200 C/C	-
3	RB1	230	450	3-T16	3-T16	T8@200 C/C	-
4	RB2	230	550	3-T16	3-T16	T8@200 C/C	-
5	LB1	230	300	3-T16	3-T16	T8@200 C/C	-



REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	25-JAN-21	ISSUED FOR BID	SKK	MCM	NR	

CLIENT: **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

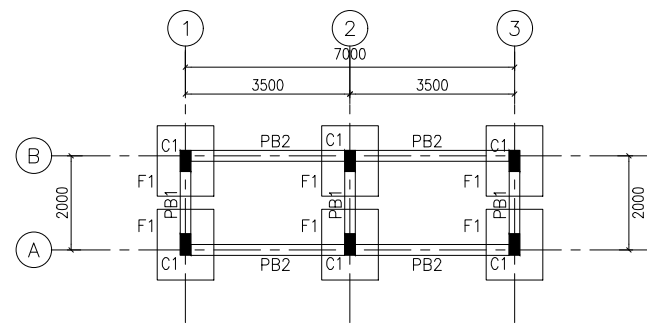
PROJECT: **CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT: **NAUVATA ENGINEERING PVT. LTD.**

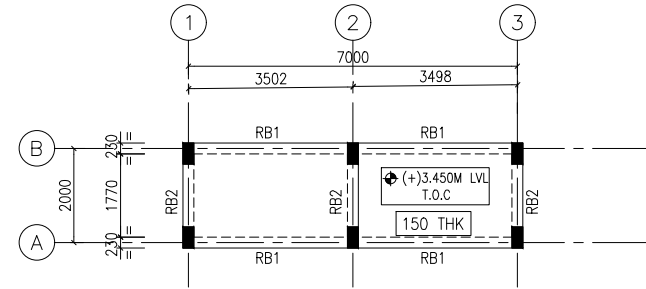
DRAWING TITLE: **SECURITY CABIN (3Nos.) RCC DETAILS**

CLIENT TENDER No: 3200000490	DRAWING No: 20005-GEN-S-DW-2310	SHT NO. 1 OF 1	REV 1	SCALE: 1:75
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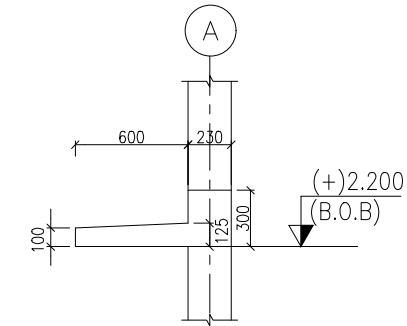
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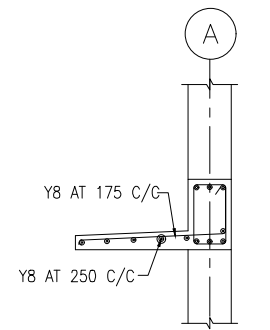
LAYOUT OF COLUMN FOOTING AND PLINTH BEAM



LAYOUT OF TERRACE FLOOR SLAB AND BEAMS +3.450m LVL. (T.O.C)



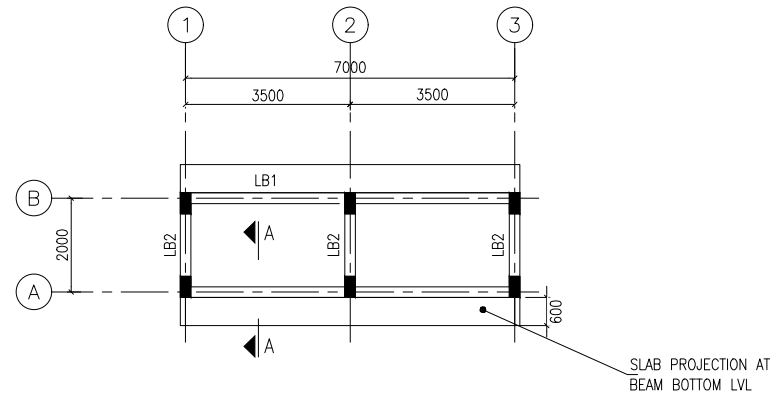
NUM DETAIL OF SEC. A-A



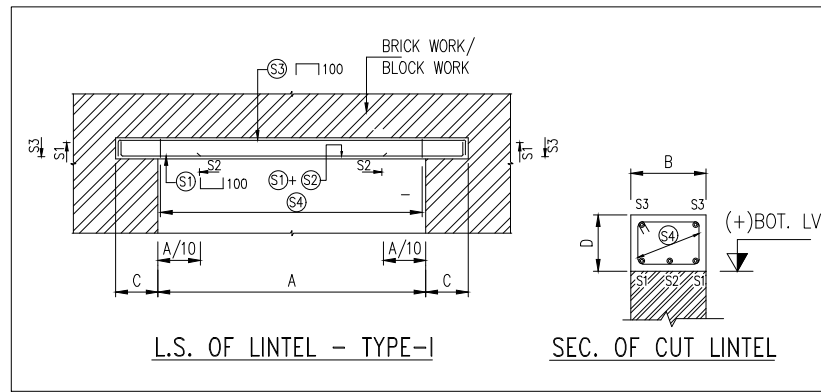
RC DETAIL OF SEC. A-A

SCHEDULE OF BEAM

SL. NO.	BEAM MARKED	H	D	BOTTOM STEEL	TOP STEEL	STIRRUPS	REMARK
1	PB1	230	350	3-T12	3-T12	T8@200 C/C	-
2	PB2	230	350	3-T12	3-T12	T8@200 C/C	-
3	RB1	230	450	3-T12	3-T12	T8@200 C/C	-
4	RB2	230	350	3-T12	3-T12	T8@200 C/C	-
5	LB1	230	300	3-T12	3-T12	T8@200 C/C	-
6	LB2	230	300	2-T12	2-T12	T8@200 C/C	-



LAYOUT OF TIE BEAMS AT +2.200m LVL. (B.O.B)



SCHEDULE OF LINTEL BEAMS FOR PARTITION WALLS

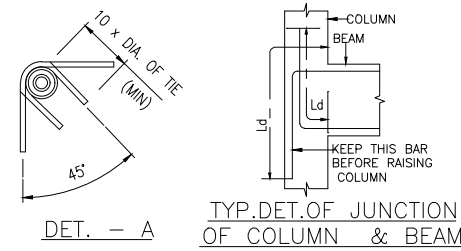
BEAM No	OPENING WIDTH A	MIN. BEARING WIDTH C	BEAM SIZE		REINF. DETAILS				LVL.
			B	D	S1	S2	S3	S4	
LB1	901 TO 1200	150	115	150	2-Y12	-	2-Y12	R8 AT 125C/C	+2.200

LEGEND

- F F L = FINISHED FLOOR LEVEL
- T O C = TOP OF CONCRETE
- F G L = FORMED GROUND LEVEL
- N G L = NATURAL GROUND LEVEL
- E R L = EXISTING ROAD LEVEL
- U O S = UNLESS OTHERWISE SPECIFIED
- T O S = TOP OF STEEL
- T H W = TREATED HARD WOOD
- B O B = BOTTOM OF BEAM
- I L = INVERTED LEVEL
- T O R = TOP OF ROAD
- = FLOW DIRECTION

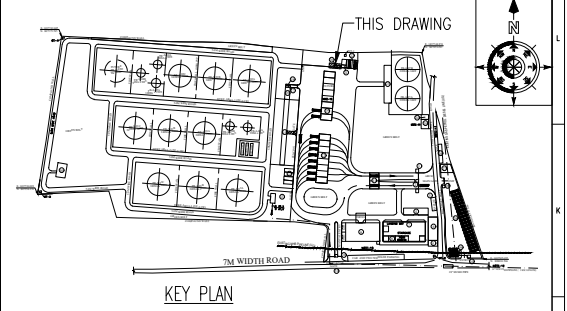
SL. NO	SIZE OF COLUMN	COLUMN TYPE	UP TO FIRST FLOOR ROOF LEVEL SECTION A-A
1	230x450	C1	• - B-Y16 Y10-① AT 100C/C ZONE-1 Y10-① AT 150C/C ZONE-2 Y8-② AT 100C/C ZONE-1 Y8-② AT 150C/C ZONE-2

SL. NO.	FOOTING TYPE	FOOTING SIZE			FOOTING REINFORCEMENT		
		L	B	D	TOP REIN. (BOTH WAYS)	BOTTOM REINFORCEMENT	
					LONGER SPAN (S1)	SHORT SPAN (S2)	
1	F1	1400	1200	300	---	10Y @ 200 C/C	10Y @ 200 C/C



NOTE:-  
ENGINEERED BACK FILLING DONE WITH SUITABLE GOOD EXCAVATED EARTH WITH GOOD FINING SURFACE

NOTES



NOTES :-

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
- GRADE OF CONCRETE SHALL BE (M30) UNLESS OTHERWISE SPECIFIED
- CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :  
FOR FOOTINGS - 50mm  
FOR COLUMNS - 40mm AND FOR BEAMS 30mm OR DIA. OF BAR WHICHEVER IS GREATER.  
FOR SLAB - 20mm OR DIA. OF LARGEST BAR WHICHEVER IS GREATER.
- 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND 'R' DENOTES ROUND BARS (MS) CONFORMING TO IS:432 (PART 1)-1982
- LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
- FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
- THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
- (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
- COL. REINF. LAPS SHALL BE STAGGERED & TO BE PROVIDED ONLY IN THE CENTRAL HALF OF CLEAR FLOOR TO FLOOR HEIGHT OR TIE BEAMS.
- TOP BARS IN BEAMS SHALL BE LAPPED WHEREVER NECESSARY AT MID SPAN AND BOTTOM BARS IN BEAMS SHALL BE LAPPED AT ONE THIRD OF SPAN DISTANCE FROM SUPPORT.
- ALL HOOKS, BENDS AND LAPS SHALL BE AS PER IS 2502-1963 AND IS 13920-1993 U.O.S.
- U.O.S. DENOTES UNLESS OTHERWISE SPECIFIED.
- PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.
- PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY
- FOR STIRRUPS ROD BENDING DETAILS BELOW
- ALL DETAILS SHOWN IN THE DRAWING ARE INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	27-JAN-21	ISSUED FOR BID	SKK	MCM	NR	

CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.

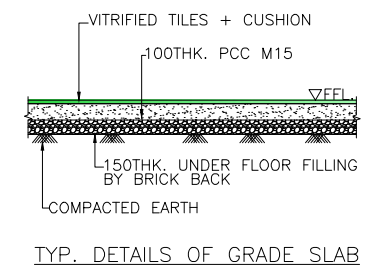
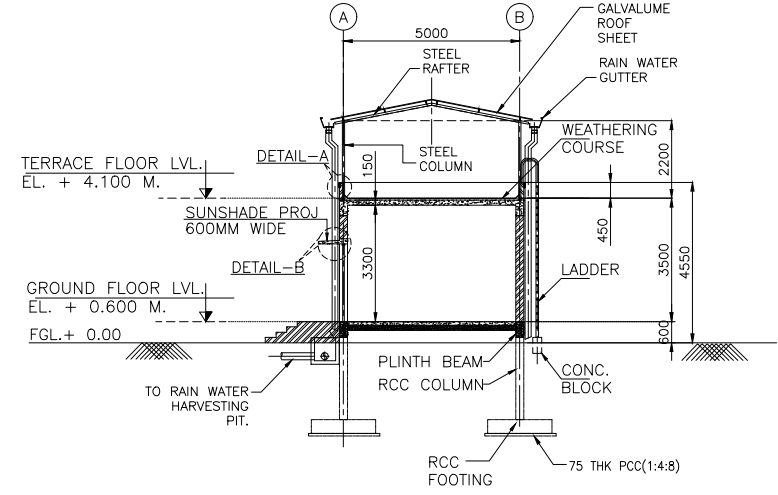
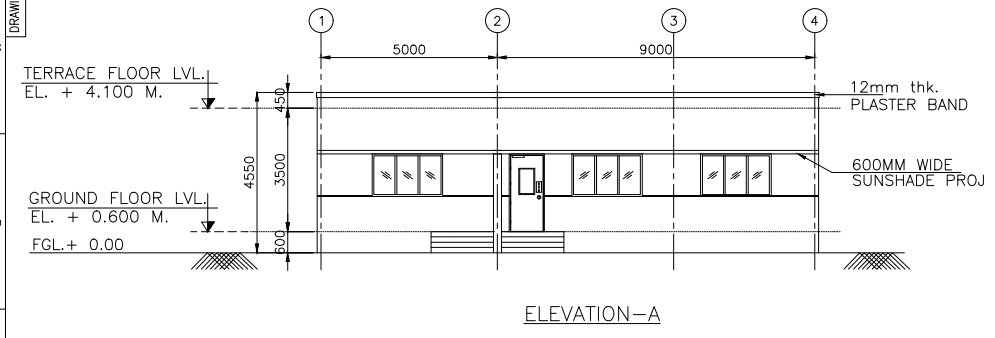
PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
SAMPLING ROOM  
RCC STRUCTURAL DETAILS

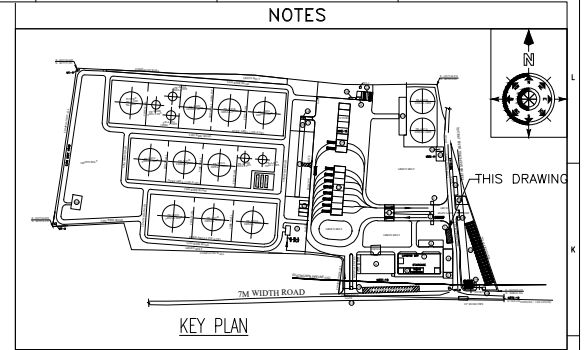
CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2312	1 OF 1	1	1:75

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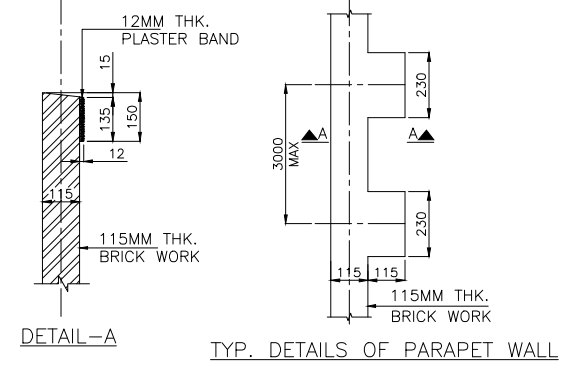
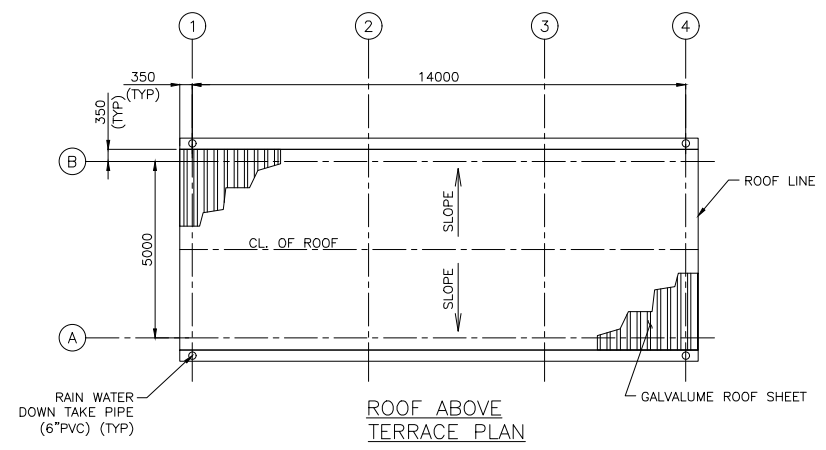
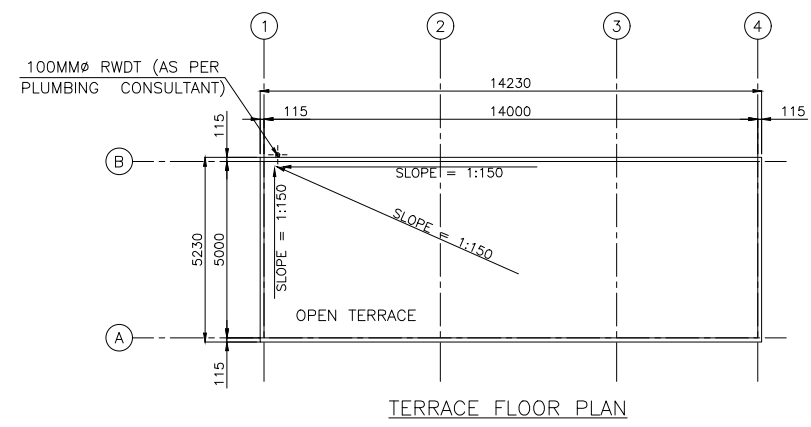
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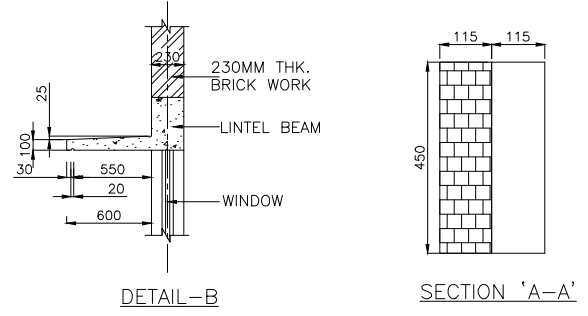
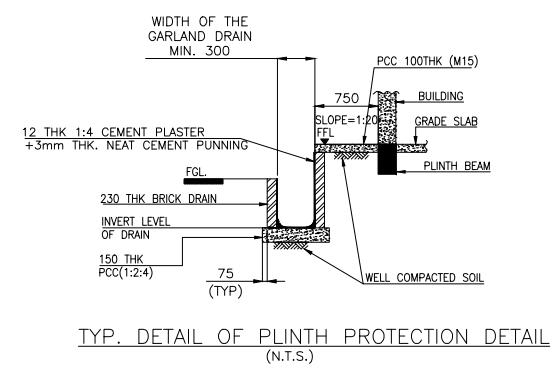
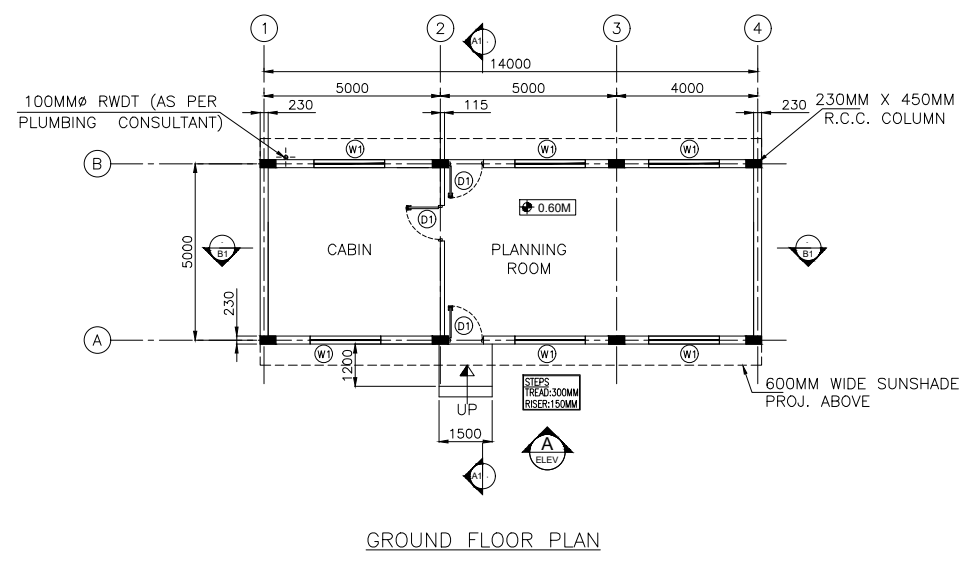
FINISHING SCHEDULE						
S.NO	DESCRIPTION	FLOOR FINISHES	INTERNAL WALL		CEILING	
			PLASTER	PAINT	PLASTER	PAINT
1.	SAMPLE ROOM	VITRIFIED TILES	12MM	WASHABLE DISTEMPER	20MM	EXTERIOR PAINT
					6MM	ACRYLIC DISTEMPER



- NOTES :-**
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
  - GRADE OF CONCRETE SHALL BE (M30) UNLESS OTHERWISE SPECIFIED
  - CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :  
 FOR FOOTINGS - 50mm  
 FOR COLUMNS - 40mm AND FOR BEAMS 30mm OR DIA. OF BAR WHICHEVER IS GREATER.  
 FOR SLAB - 20mm OR DIA. OF LARGEST BAR WHICHEVER IS GREATER.
  - 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND 'R' DENOTES ROUND BARS (MS) CONFORMING TO IS:432 (PART 1)-1982
  - LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
  - FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
  - THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
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  - COL. REINF. LAPS SHALL BE STAGGERED & TO BE PROVIDED ONLY IN THE CENTRAL HALF OF CLEAR FLOOR TO FLOOR HEIGHT OR TIE BEAMS.
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  - U.O.S DENOTES UNLESS OTHERWISE SPECIFIED.
  - PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.
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  - FOR STIRRUPS ROD BENDING DETAILS BELOW
  - ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.



1	D1	900	2200	WOODEN FRAME WITH PRE LAMINATED FLUSH DOOR.
2	W1	1800	1200	UPVC 3-TRACK WINDOW WITH INSECT NET SLIDING GLASS PANELS WITH SAFETY METAL GRILLS.



REFERENCE DRAWING :-  
 01. DRAWING NO.: 20005-GEN-S-DW-2313 SH-2

1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	29-JAN-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

CLIENT:  
**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

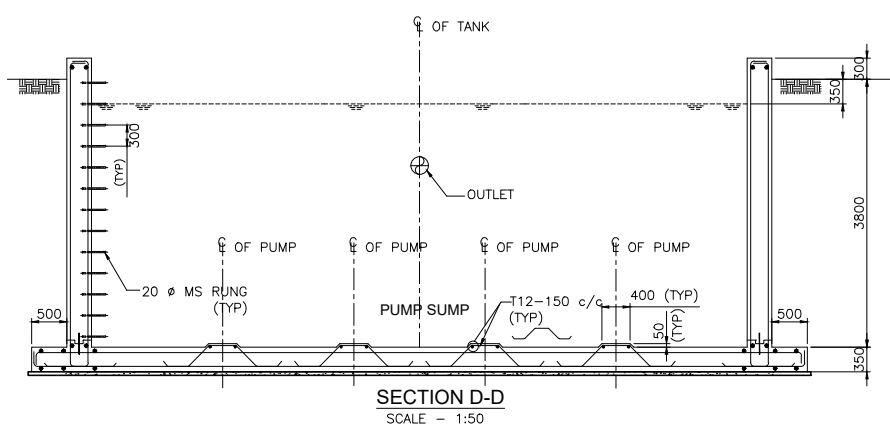
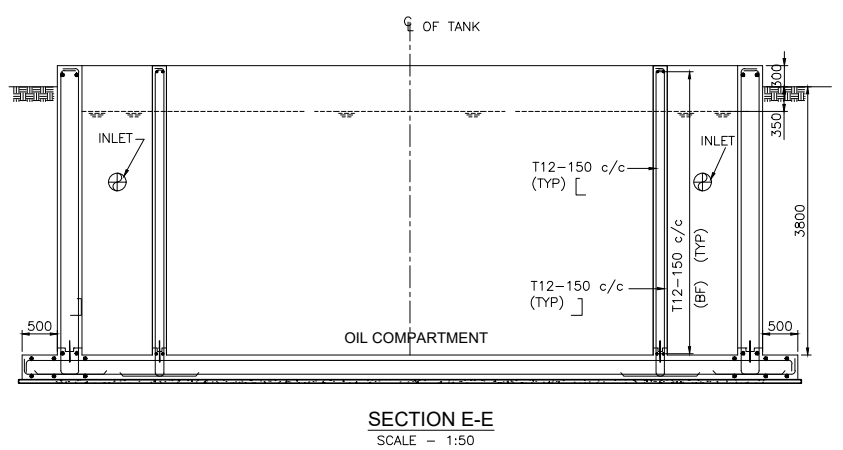
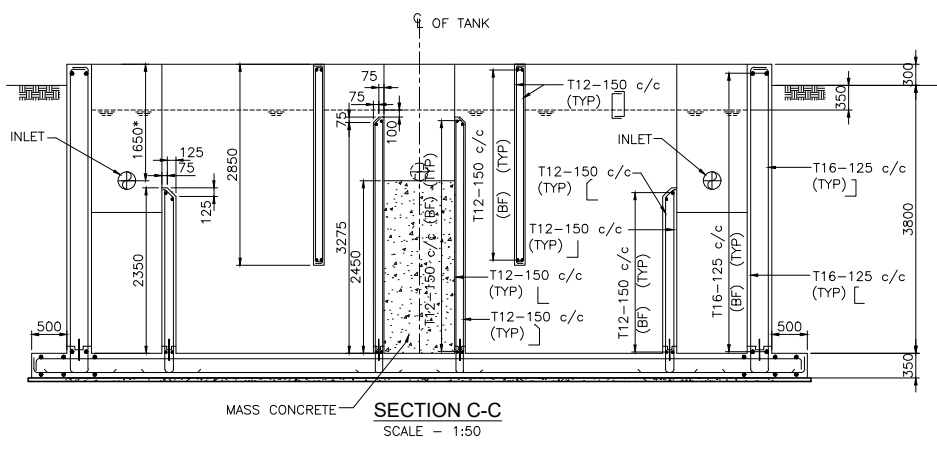
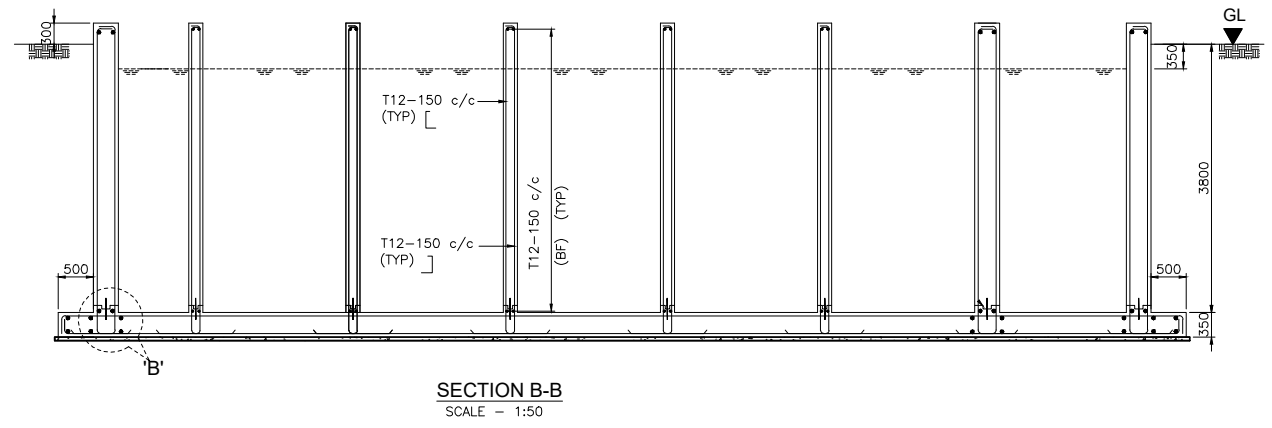
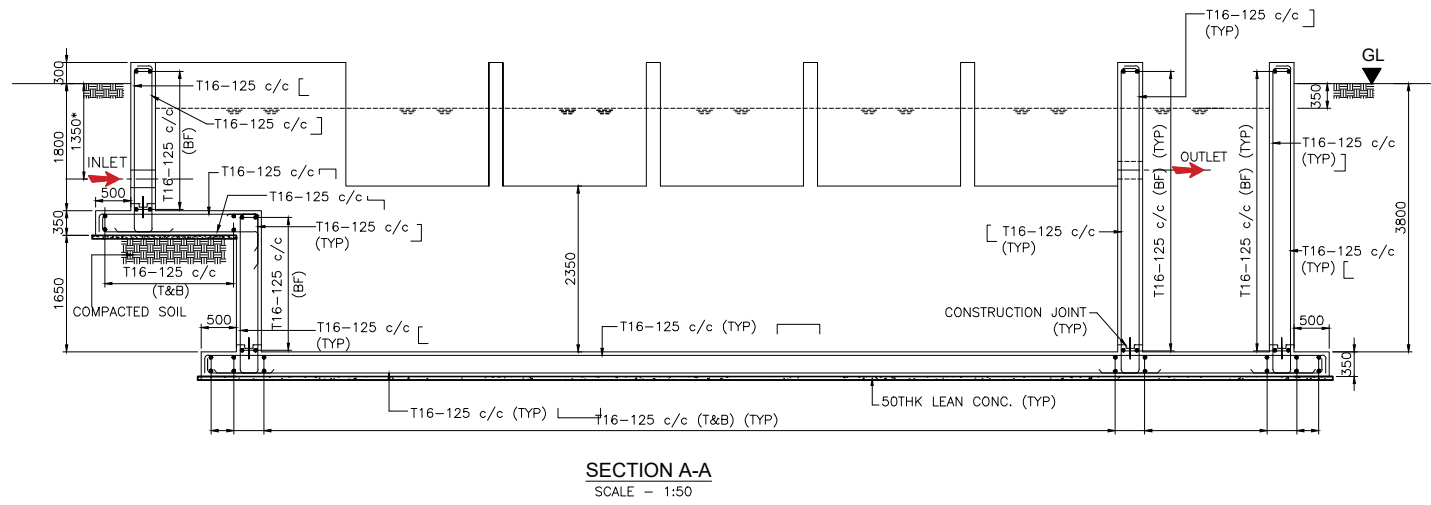
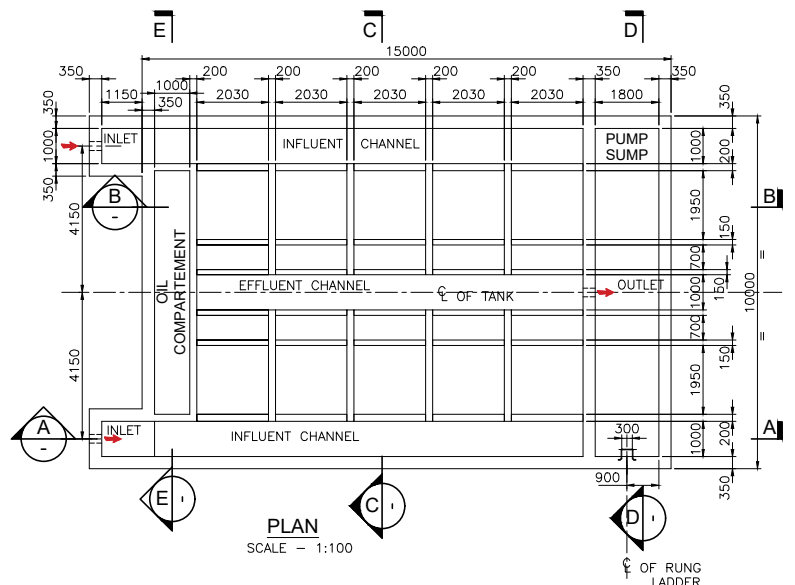
PROJECT MANAGEMENT CONSULTANT:  
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**PLANNING ROOM PLAN, SECTIONS AND ELEVATIONS**

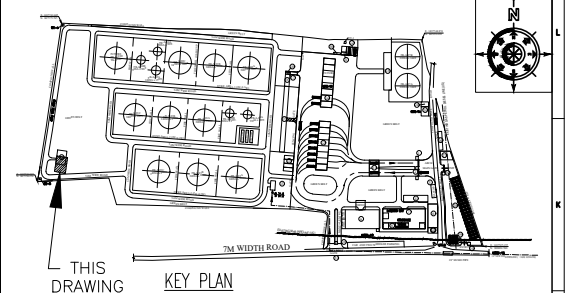
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320000490	20005-GEN-S-DW-2313	1 OF 2	1	1:75

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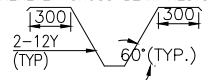
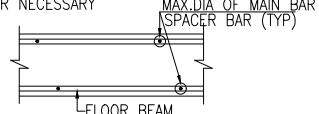
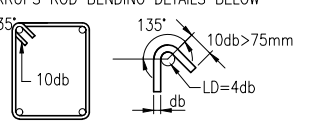
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**NOTES**




**NOTES :-**

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
- GRADE OF CONCRETE SHALL BE (M30) UNLESS OTHERWISE SPECIFIED
- CLEAR COVER FOR ALL MAIN REINFORCEMENTS SHALL BE AS FOLLOWS :  
 FOR FOOTINGS - 50mm  
 FOR COLUMNS - 40mm AND FOR BEAMS 30mm OR DIA. OF BAR WHICHEVER IS GREATER.  
 FOR SLAB - 20mm OR DIA. OF LARGEST BAR WHICHEVER IS GREATER.
- 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND 'R' DENOTES ROUND BARS (MS) CONFORMING TO IS:432 (PART 1)-1982
- LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
- FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
- THIS DRG. SHALL BE READ IN CONJUNCTION WITH ARCH'S DRGS. (LATEST REVISION)
- (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
- COL. REINFT. LAPS SHALL BE STAGGERED & TO BE PROVIDED ONLY IN THE CENTRAL HALF OF CLEAR FLOOR TO FLOOR HEIGHT OR TIE BEAMS.
- TOP BARS IN BEAMS SHALL BE LAPPED WHEREVER NECESSARY AT MID SPAN AND BOTTOM BARS IN BEAMS SHALL BE LAPPED AT ONE THIRD OF SPAN DISTANCE FROM SUPPORT.
- ALL HOOKS, BENDS AND LAPS SHALL BE AS PER IS 2502-1963 AND IS 13920-1993 U.O.S.
- U.O.S. DENOTES UNLESS OTHERWISE SPECIFIED.
- PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.  

- PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY  

- FOR STIRRUPS ROD BENDING DETAILS BELOW  

- ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

1	11-MAR-21	RE-ISSUED FOR BID	RN	MCM	NR
0	27-JAN-21	ISSUED FOR BID	SKK	MCM	NR
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD
			NAU		MRPL

CLIENT:  
 **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

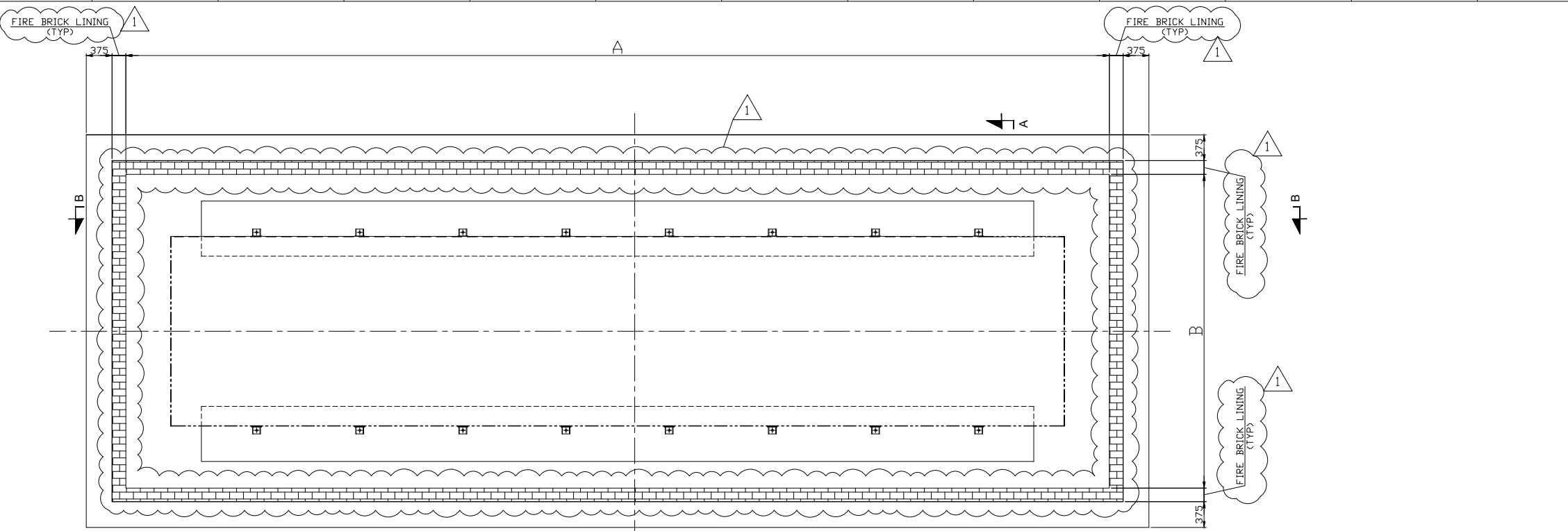
PROJECT MANAGEMENT CONSULTANT:  
 **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**OIL WATER SEPERATOR (OWS) PLAN AND SECTIONS DEAILS**

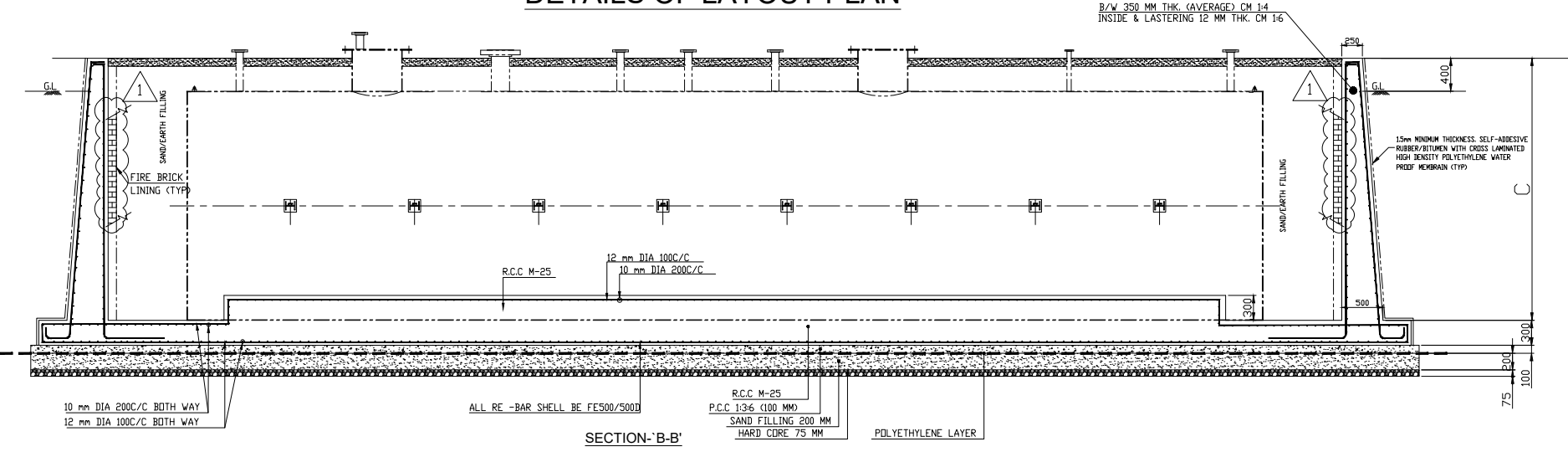
CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2326	1 OF 1	1	1:75

ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED / STORED IN RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANYMEANS ELECTRONIC, MECHANICAL,PHOTOCOPYING, XEROXING OR OTHERWISE WITHOUT PRIOR PERMISSION FROM NAUVATA ENGINEERING LTD./MRPL

DRAWING NO.: 20005-GEN-S-DW-2327

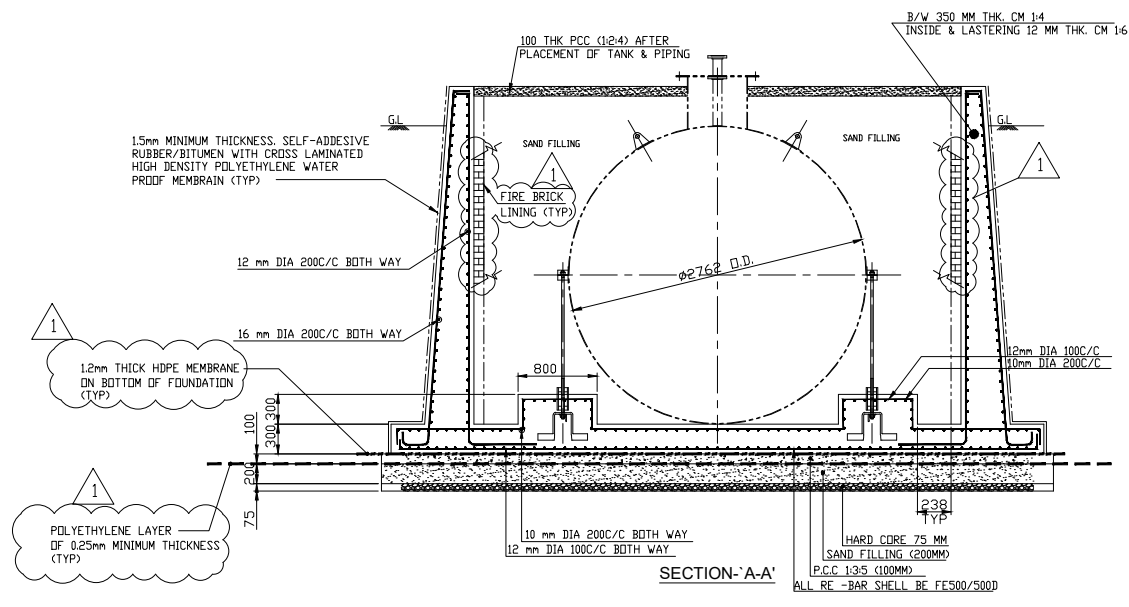


**DETAILS OF LAYOUT PLAN**

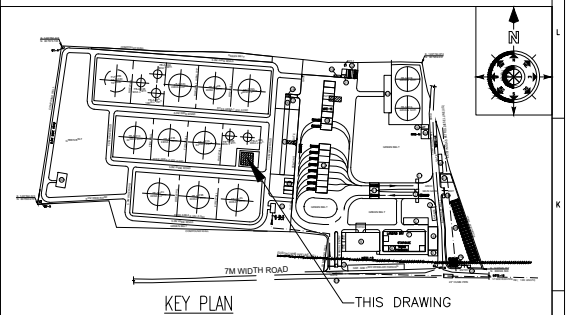


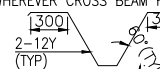
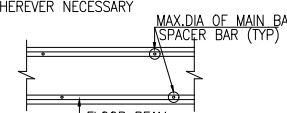
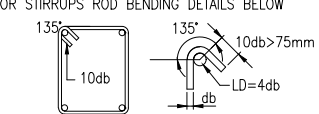
**SECTION-B-B**

TANK NO.	DIMENSION (M)		
	A	B	C
FB-A-08A	14.0	4.262	3.162
FB-A-09A	14.0	4.262	3.162
FB-A-10A	14.0	4.262	3.162



**SECTION-A-A**




- NOTES :-**
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  - GRADE OF CONCRETE SHALL BE (M30) UNLESS OTHERWISE SPECIFIED
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  - 'Y' DENOTES HYSD BARS (Fe 500) CONFORMING TO IS:1786-1985 AND
  - LAP LENGTH SHALL BE 50 TIMES DIA. OF BAR FOR M25 GRADE OF CONCRETE AND SHALL BE KEPT STAGGERED.
  - FOR LOCATION, ORIENTATION & R.L. OF THE BUILDING REF. RESPECTIVE ARCH. DRGS. (LATEST REVISION)
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  - (±)0.000m LVL CORRESPONDS TO FFL OF THE BUILDING.
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  - U.O.S DENOTES UNLESS OTHERWISE SPECIFIED.
  - PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.  

  - PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY  

  - FOR STIRRUPS ROD BENDING DETAILS BELOW  

  - MIN. SAFE BEARING CAPACITY OF SOIL AT 2.0M BELOW FGL CONSIDERED AS 25.0 T/sq.m.
  - ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

1	11-MAR-21	RE-ISSUED FOR BID	SKK	MCM	NR	
0	08-MAR-21	ISSUE FOR BID	YG	KSH	ASN	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL

CLIENT:  
 **MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.**

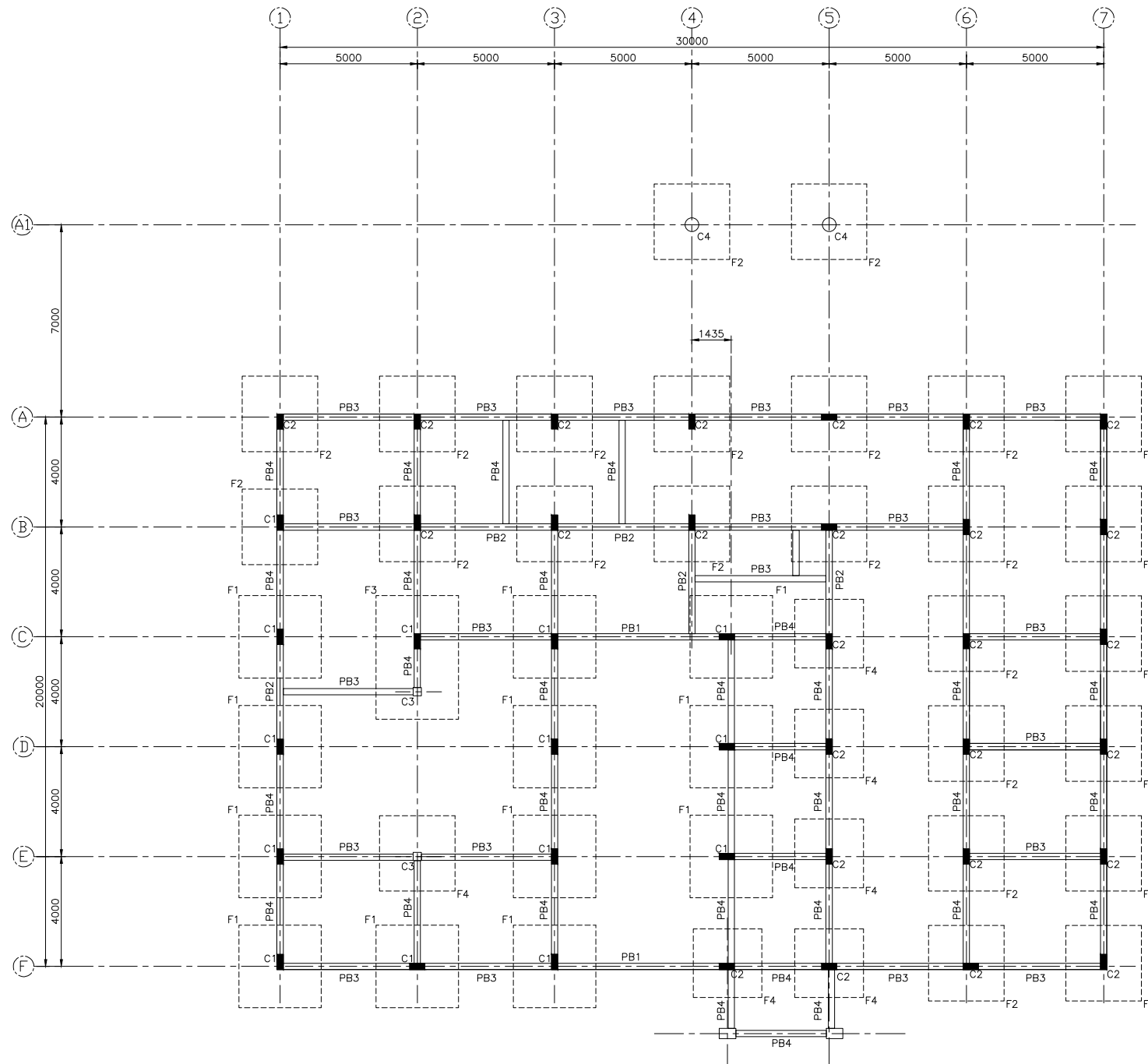
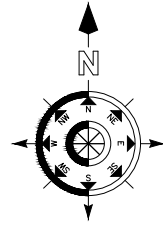
PROJECT MANAGEMENT CONSULTANT:  
 **NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**RCC DETAIL FOR UNDER GROUND TANK FOR (FB-A-08A) (FB-A-09A) AND (FB-A-10A)**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2327	1 OF 1	1	1:1

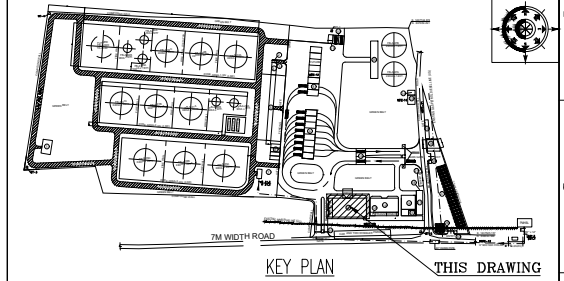
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DRAWING NO.: 20005-GEN-S-DW-2302

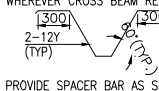
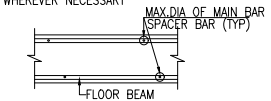
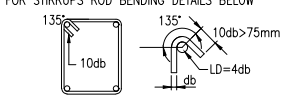


**FOOTING LAYOUT, PLINTH BEAM AND SLAB LAYOUT  
AT GROUND FLOOR LEVEL.**

**NOTES**



**NOTES :-**

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
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13. PROVIDE SHEAR BAR AS SHOWN BELOW WHEREVER CROSS BEAM RESTS OVER MAIN BEAM.  

14. PROVIDE SPACER BAR AS SHOWN BELOW WHEREVER NECESSARY  

15. FOR STIRRUPS ROD BENDING DETAILS BELOW  

16. ALL DETAILS SHOWN IN THE DRAWING ARE MINIMUM AND INDICATIVE ONLY, SAME SHALL BE UPDATED DURING DETAIL ENGINEERING STAGE.

**REFERENCE DRAWING:**

1. DRAWING NO.:- 20005-GEN-S-DW-2302, SH-2 OF 6  
 20005-GEN-S-DW-2302, SH-3 OF 6  
 20005-GEN-S-DW-2302, SH-4 OF 6  
 20005-GEN-S-DW-2302, SH-5 OF 6  
 20005-GEN-S-DW-2302, SH-6 OF 6

0	08-FEB-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

CLIENT:  

**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
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PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL  
 PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT:  

**NAUVATA ENGINEERING PVT. LTD.**

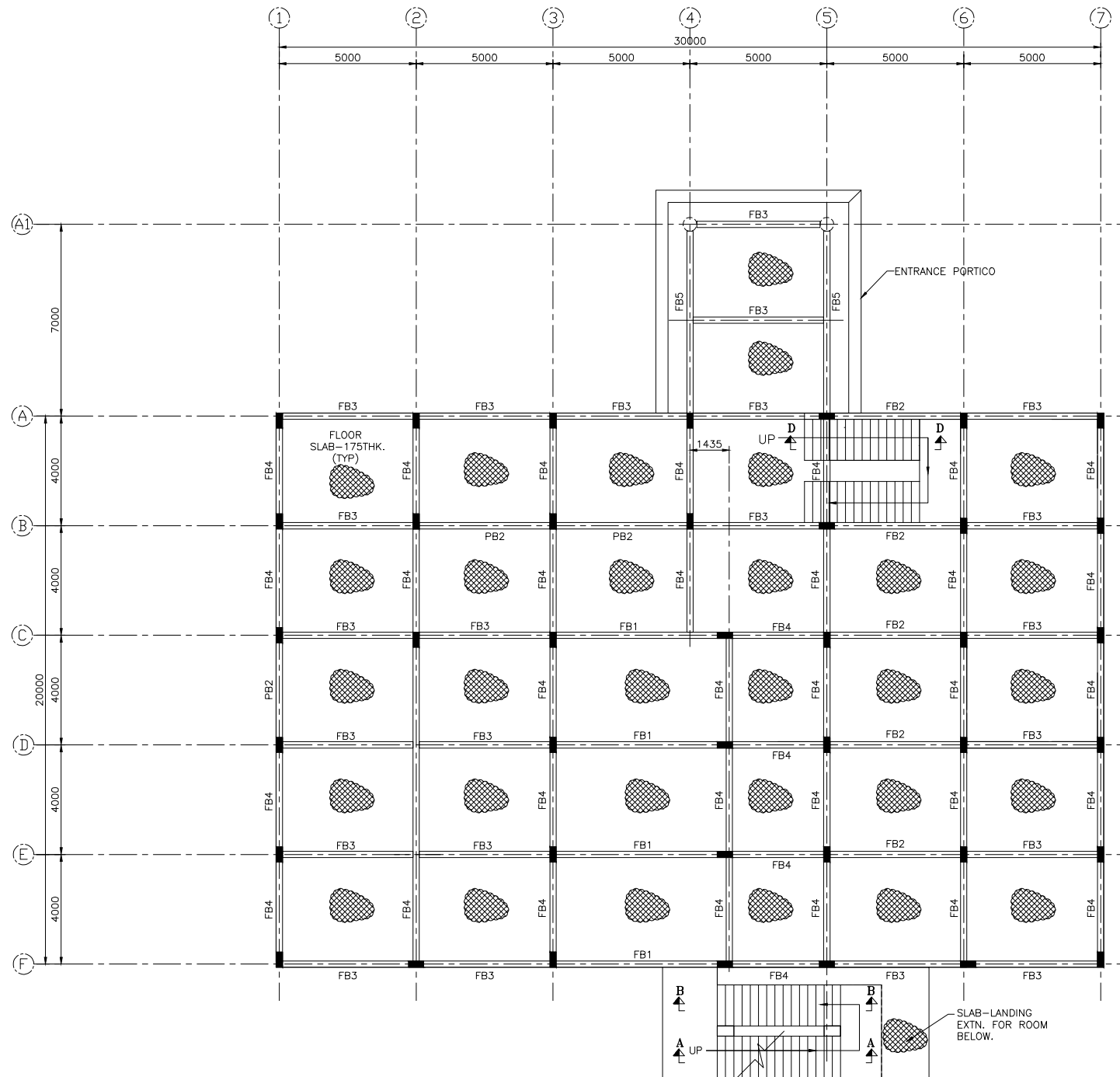
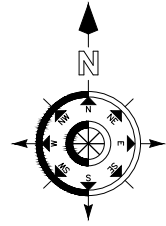
DRAWING TITLE:  
**TYPICAL ADMIN, AMENITY  
 AND CONTROL BUILDINGS SCHEMATIC PLAN  
 TYPICAL RCC DETAILS**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2302	1 OF 6	0	1:100

ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED / STORED IN RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPIING, XEROXING OR OTHERWISE WITHOUT PRIOR PERMISSION FROM NAUVATA ENGINEERING LTD./MRPL



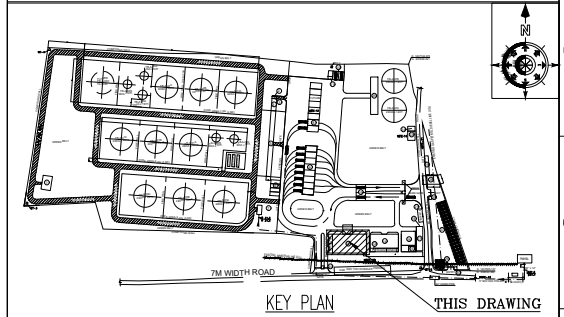
DRAWING NO.: 20005-GEN-S-DW-2302



**BEAM AND SLAB LAYOUT  
AT GROUND FLOOR LEVEL. EL. +4.800**

ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED / STORED IN RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPIING, XEROXING OR OTHERWISE WITHOUT PRIOR PERMISSION FROM NAUVATA ENGINEERING LTD./MRPL

**NOTES**



**NOTES :-**

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2. FOR ALL OTHER NOTES REFER SHEET-1

**REFERENCE DRAWING:**

1. DRAWING NO.:- 20005-GEN-S-DW-2302, SH-1 OF 6
- 20005-GEN-S-DW-2302, SH-3 OF 6
- 20005-GEN-S-DW-2302, SH-4 OF 6
- 20005-GEN-S-DW-2302, SH-5 OF 6
- 20005-GEN-S-DW-2302, SH-6 OF 6

0	08-FEB-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

CLIENT:  

**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
 (A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL  
 PROJECT AT DEVANGONTHI, BANGALORE.**

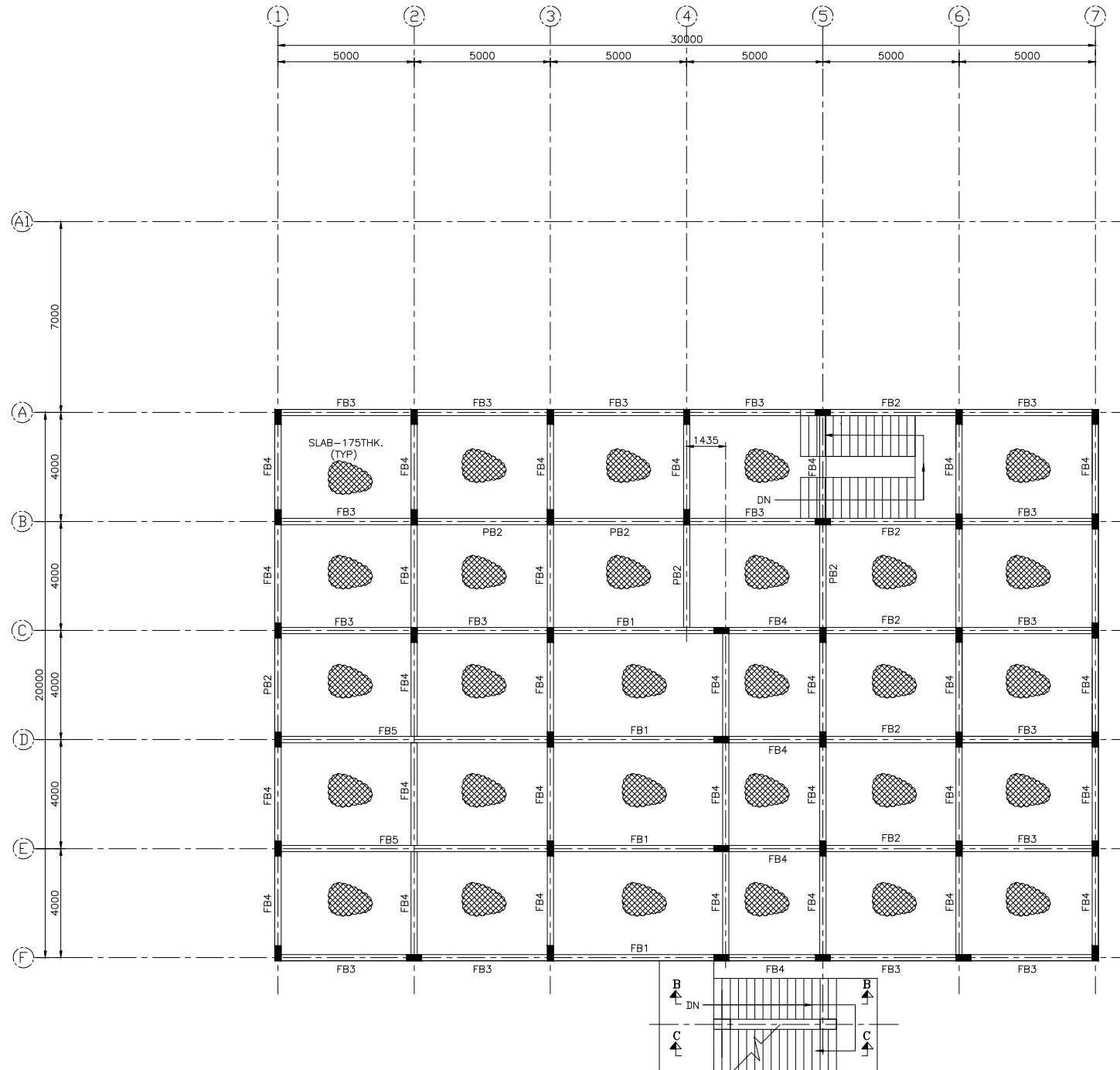
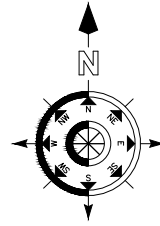
PROJECT MANAGEMENT CONSULTANT:  

**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**TYPICAL ADMIN, AMENITY  
 AND CONTROL BUILDINGS SCHEMATIC PLAN  
 TYPICAL RCC DETAILS**

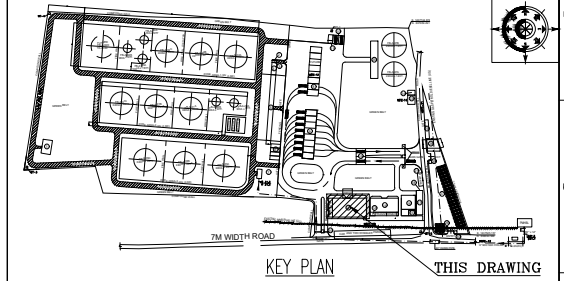
CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2302	2 OF 6	0	1:100

DRAWING NO.: 20005-GEN-S-DW-2302



**BEAM AND SLAB LAYOUT  
AT FIRST FLOOR LEVEL. EL. +8.800**

**NOTES**



**NOTES :-**

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2. FOR ALL OTHER NOTES REFER SHEET-1

**REFERENCE DRAWING:**

1. DRAWING NO.:- 20005-GEN-S-DW-2302, SH-1 OF 6
- 20005-GEN-S-DW-2302, SH-2 OF 6
- 20005-GEN-S-DW-2302, SH-4 OF 6
- 20005-GEN-S-DW-2302, SH-5 OF 6
- 20005-GEN-S-DW-2302, SH-6 OF 6


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0	08-FEB-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

CLIENT:  

**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
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PROJECT:  
**CONSTRUCTION OF MARKETING TERMINAL  
 PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT:  

**NAUVATA ENGINEERING PVT. LTD.**

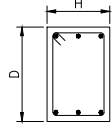
DRAWING TITLE:  
**TYPICAL ADMIN, AMENITY  
 AND CONTROL BUILDINGS SCHEMATIC PLAN  
 TYPICAL RCC DETAILS**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2302	3 OF 6	0	1:100

DRAWING NO.: 20005-GEN-S-DW-2302

**SCHEDULE OF BEAM**

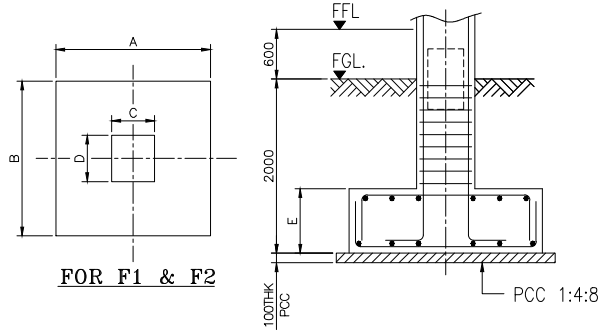
SL. NO.	BEAM MARKED	H	D	TOP	ADD. TOP	BOTTOM	ADD. BOTTOM	STIRRUPS	REMARK
1	PB1	230	900	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
2	PB2	230	750	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
3	PB3	230	650	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
4	PB4	230	600	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
5	FB1	230	750	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
6	FB2	230	750	3-T12	3-T12	2-T16	2-T16	T8@200 C/C	-
7	FB3	230	650	2-T12	2-T12	3-T16	2-T16	T8@200 C/C	-
8	FB4	230	650	2-T12	2-T12	3-T16	2-T16	T8@200 C/C	-
9	FB5	350	900	3-T16	3-T16	4-T16	3-T16	T8@200 C/C	-



**NOTES**

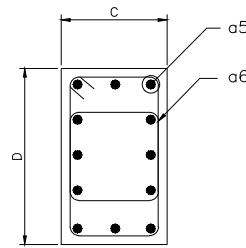
1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
2. FOR ALL OTHER NOTES REFER SHEET-1

**SCHEDULE OF FOOTING**

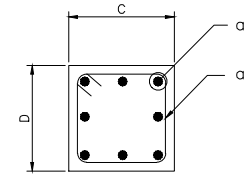


FOR F1 & F2

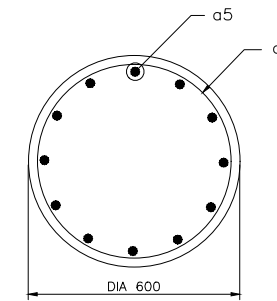
SL. NO.	FOOTING MARKED	A	B	E	REINFORCEMENT STEEL			
					a1	a2	a3	a4
1	F1	3000	3000	500	T12@200 C/C	T12@200 C/C	T12@250 C/C	T12@250 C/C
2	F2	2750	2750	450	T12@200 C/C	T12@200 C/C	T12@225 C/C	T12@225 C/C
3	F3	3000	4500	450	T12@200 C/C	T12@200 C/C	T12@225 C/C	T12@225 C/C
4	F4	2500	2500	400	T12@200 C/C	T12@200 C/C	T12@225 C/C	T12@225 C/C



COLUMN C1/C2  
SECTION S1-S1



COLUMN C3  
SECTION S1-S1



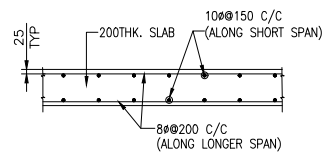
COLUMN C4  
SECTION S1-S1

**SCHEDULE OF COLUMN**

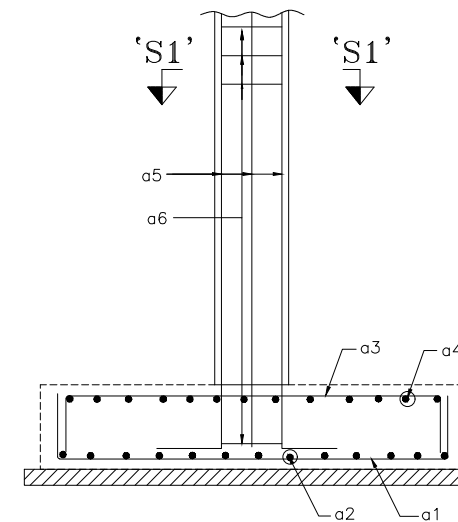
SL. NO.	COLUMN MARKED	C	D	MAIN STEEL-a5	STIRRUPS a6	REMARK
1	C1	300	600	20-T16	T8@200 C/C	-
2	C2	300	450	20-T16	T8@200 C/C	-
3	C3	300	300	16-T16	T8@200 C/C	UPTO PLINTH TOP
3	C4	600φ	-	12-T20	T8@200 C/C	-

**REFERENCE DRAWING:**

1. DRAWING NO.:- 20005-GEN-S-DW-2302, SH-1 OF 6  
20005-GEN-S-DW-2302, SH-2 OF 6  
20005-GEN-S-DW-2302, SH-3 OF 6  
20005-GEN-S-DW-2302, SH-5 OF 6  
20005-GEN-S-DW-2302, SH-6 OF 6



REINFORCEMENT DETAIL OF RCC FLOOR & ROOF SLAB



FOOTING & PEDESTAL  
(TYP. REINFORCEMENT DETAILS)

0	08-FEB-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
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PROJECT MANAGEMENT CONSULTANT:  

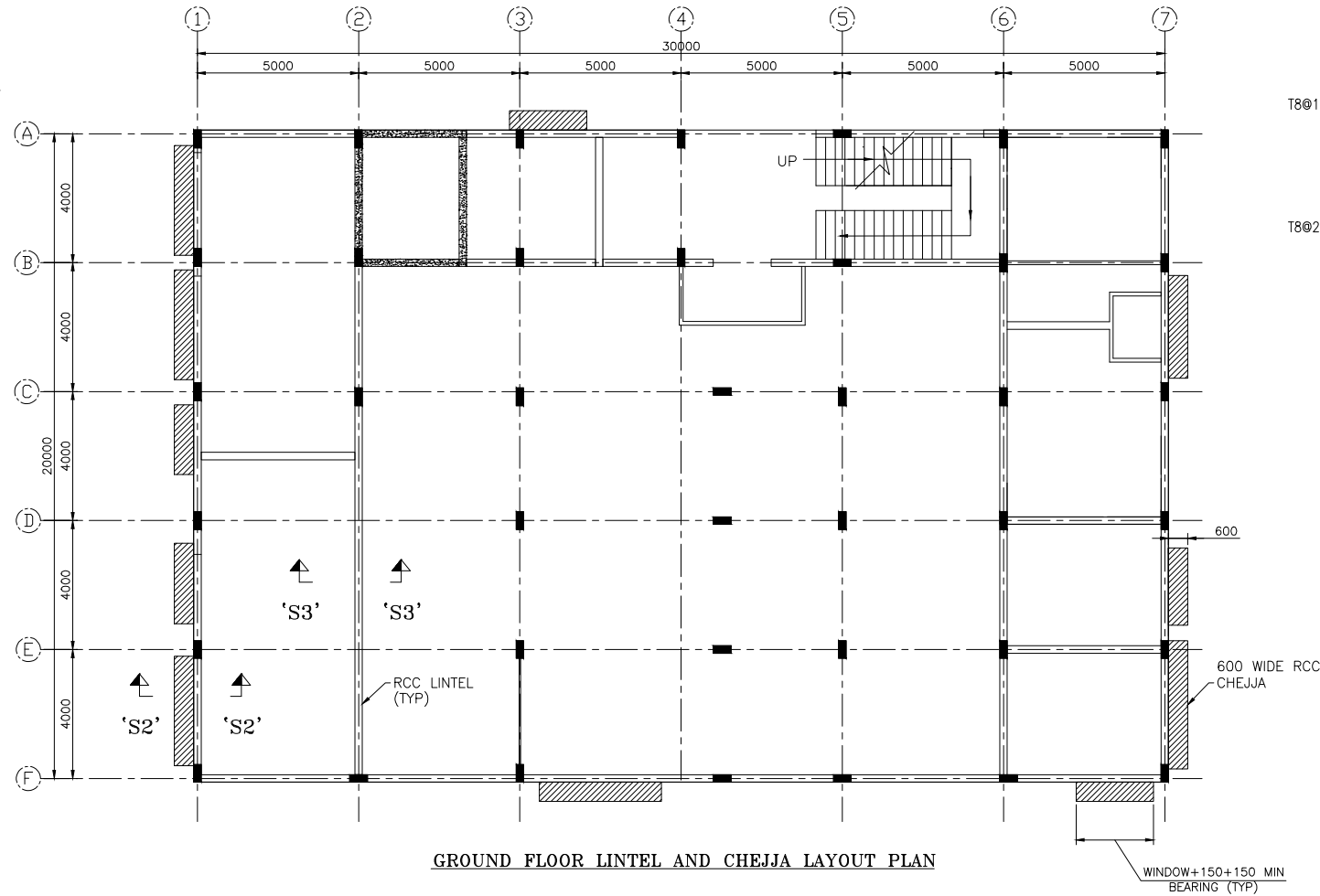
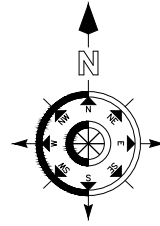
**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:  
**TYPICAL ADMIN, AMENITY  
 AND CONTROL BUILDINGS SCHEMATIC PLAN  
 TYPICAL RCC DETAILS**

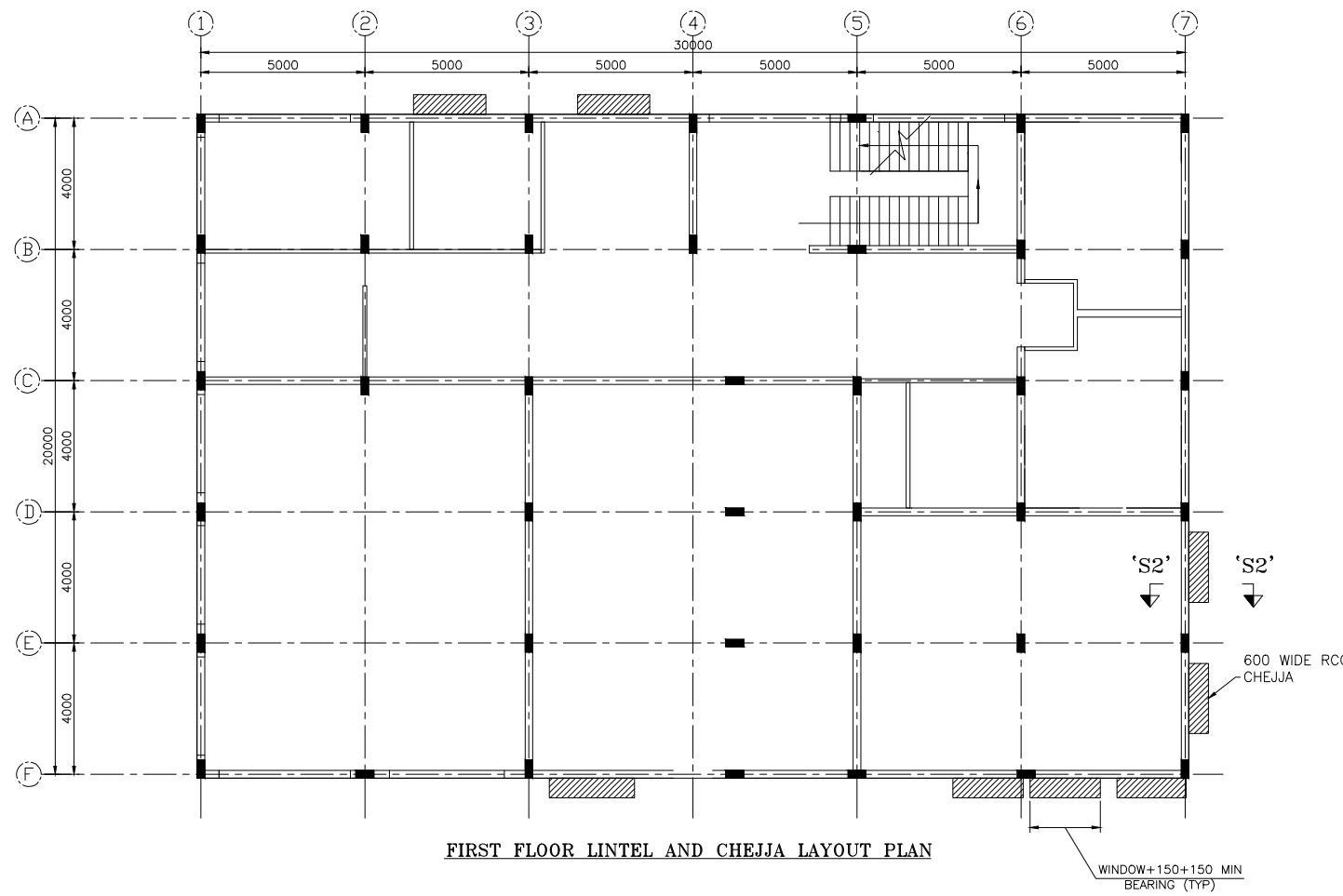
CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2302	4 OF 6	0	1:100

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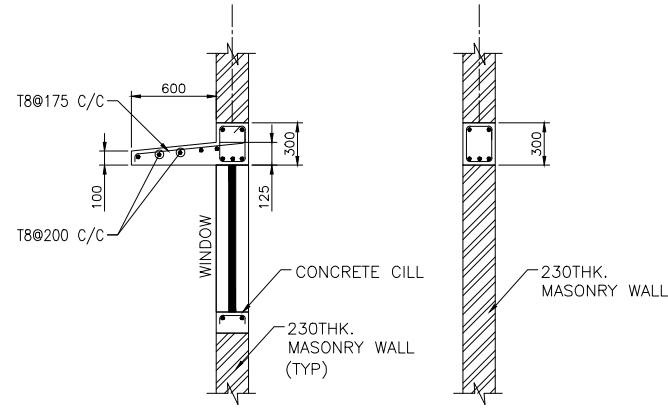
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GROUND FLOOR LINTEL AND CHEJJA LAYOUT PLAN

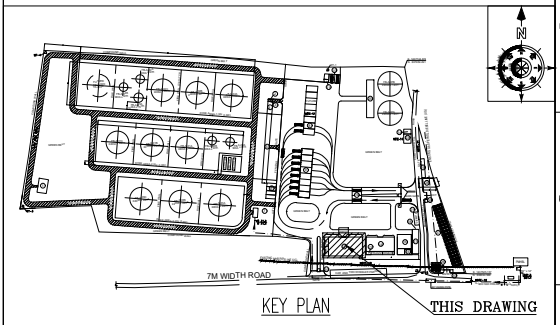


FIRST FLOOR LINTEL AND CHEJJA LAYOUT PLAN



SECTION S2-S2 SECTION S3-S3  
TYP. DET. OF LINTEL WITH CHAJJA

NOTES



NOTES :-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
2. FOR ALL OTHER NOTES REFER SHEET-1

REFERENCE DRAWING:

1. DRAWING NO.:- 20005-GEN-S-DW-2302, SH-1 OF 6
- 20005-GEN-S-DW-2302, SH-2 OF 6
- 20005-GEN-S-DW-2302, SH-3 OF 6
- 20005-GEN-S-DW-2302, SH-4 OF 6
- 20005-GEN-S-DW-2302, SH-6 OF 6

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0	08-FEB-21	ISSUED FOR BID	SKK	MCM	NR	
REV.	DATE	DESCRIPTION	DRWN	CHKD	APPRD	MRPL
			NAU			

CLIENT:

**MANGALORE REFINERY AND PETROCHEMICALS LIMITED**  
(A subsidiary of Oil & Natural Gas Corpn. Ltd - ONGC)

PROJECT: CONSTRUCTION OF MARKETING TERMINAL PROJECT AT DEVANGONTHI, BANGALORE.

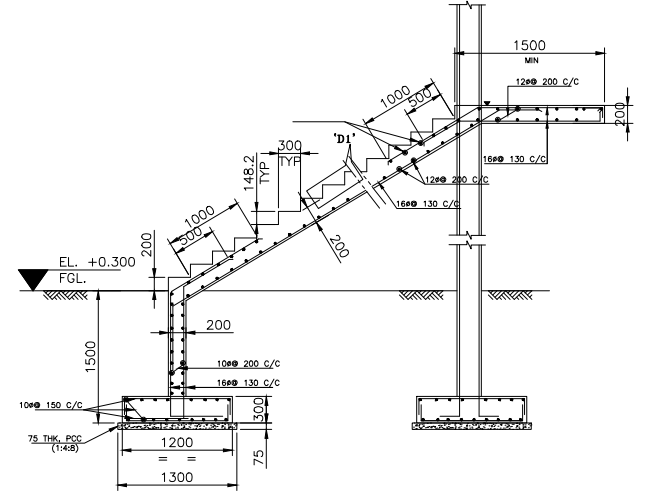
PROJECT MANAGEMENT CONSULTANT:

**NAUVATA ENGINEERING PVT. LTD.**

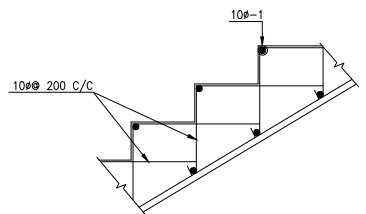
DRAWING TITLE: TYPICAL ADMIN, AMENITY AND CONTROL BUILDINGS SCHEMATIC PLAN TYPICAL RCC DETAILS

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3200000490	20005-GEN-S-DW-2302	5 OF 6	0	1:100

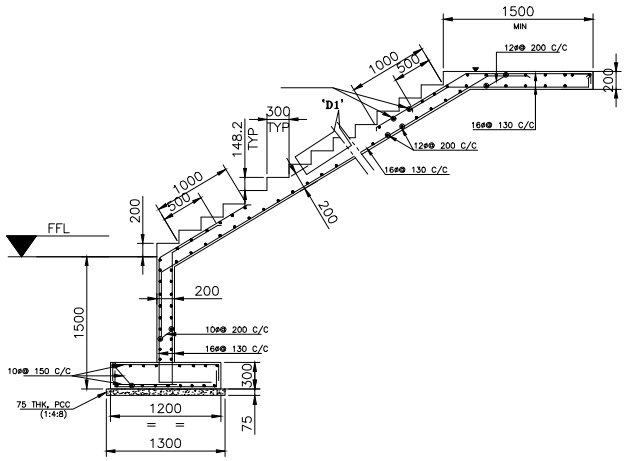
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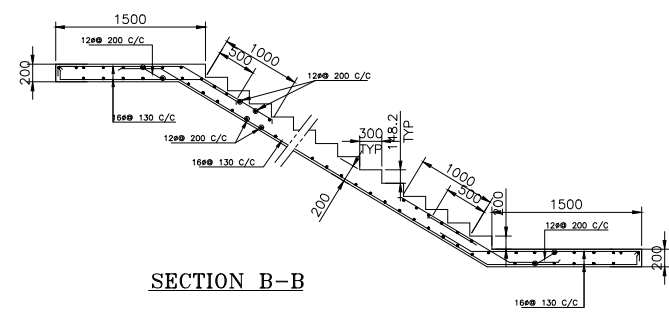
SECTION A-A



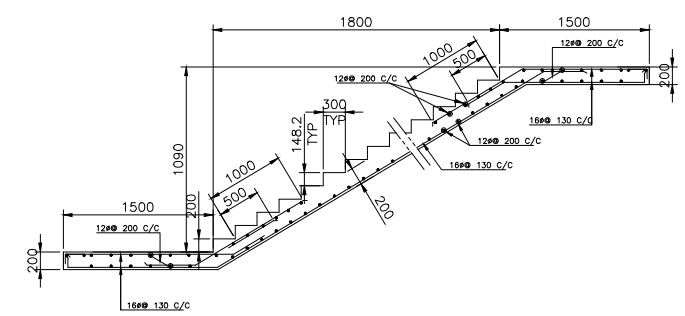
TYP. DETAIL - 'D1'



SECTION D-D



SECTION B-B



SECTION C-C

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
2. FOR ALL OTHER NOTES REFER SHEET-1

REFERENCE DRAWING:

1. DRAWING NO.: 20005-GEN-S-DW-2302, SH-1 OF 6
- 20005-GEN-S-DW-2302, SH-2 OF 6
- 20005-GEN-S-DW-2302, SH-3 OF 6
- 20005-GEN-S-DW-2302, SH-4 OF 6
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PROJECT:

**CONSTRUCTION OF MARKETING TERMINAL  
PROJECT AT DEVANGONTHI, BANGALORE.**

PROJECT MANAGEMENT CONSULTANT:

**NAUVATA ENGINEERING PVT. LTD.**

DRAWING TITLE:

**TYPICAL ADMIN, AMENITY  
AND CONTROL BUILDINGS SCHEMATIC PLAN  
TYPICAL RCC DETAILS**

CLIENT TENDER No:	DRAWING No:	SHT NO.	REV	SCALE:
3200000490	20005-GEN-S-DW-2302	6 OF 6	0	1:100