NOTICE INVITING TENDER FOR CONSTRUCTION OF MULTISTORIED RESIDENTIAL BUILDING AT STAFF COLONY

REQUEST FOR QUOTATION
CRFQ NO: 1000261825
E-TENDER REF: 15213
DUE DATE: 29.08.2016
REQUEST FOR QUOTATION CRFQ 1000261825 E-Tender 15213

1.0 INTRODUCTION

The bids are invited through E-tendering platform under two-bid system (i.e. Part 1 - Techno-commercial/Un priced Bid & Part 2 - Priced Bid) as outlined below. Bidders can download the complete set of tender documents from, our website at e-procurement platform https://bpclproc.in, www.bharatpetroleum.in and on Government website http://eprocure.gov.in/cppp/relatedlinks.

(Contact persons: Mr. Nilesh Narkhede, Asst. Manager (P&CS) Phone: 0091-22-2553 3285)

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TENDER FOR CONSTRUCTION OF MULTISTORIED RESIDENTIAL BUILDING AT STAFF
COLONY.

1. Bharat Petroleum Corporation Limited is a Fortune 500 Navratna PSU engaged in manufacturing
   and Marketing of diverse range of Petroleum Products.

2. We intend to line up contract for Construction of Multistoried Residential building at Staff
   colony. We are pleased to invite the BIDS for the above mentioned job, as per tender
   specifications (enclosed).

3. **EARNEST MONEY DEPOSIT (EMD):** EMD of amount as mentioned below as applicable is
   required to be submitted, in physical form at our office in a sealed cover addressed to Chief
   Manager P&CS, with following boldly super-scribed on the cover/ envelope:

   i. CRFQ Number:
   ii. Item:
   iii. Closing Date/Time:
   iv. Name of the Bidder:

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction of Multistoried Residential building at Staff colony</td>
<td>10,00,000.00</td>
</tr>
</tbody>
</table>

   • **The BIDDERS** shall ensure that the EMD in the form of DD / BG, drawn in favor of “Bharat
     Petroleum Corporation Limited”, payable at Mumbai, from any Branch of Indian Nationalized
     Banks. It should be delivered to Chief Manager P&CS or sent by Registered Post / Couriered to
     the following address **so as to reach on or before the due date & time of the tender:**

     P&CS Dept, South Block, Admin Building
     Mumbai Refinery, Mahul Gaon, Mumbai-400 074.

   • BPCL will not be responsible for non-receipt of EMD (s) due to postal delay/ loss in transit etc. Bid
     received without the EMD, if applicable, is liable to be rejected.

   • EMD shall be applicable for REGISTERED as well as NON-REGISTERED vendors of BPCL.

   • **Scanned copy of EMD shall be uploaded on BPCL e-procurement website and later
     shall be sent to above mentioned address before due date of the tender.**

   • EMD shall be valid for period of 8 months from the date of submission of bids.

4. **EXEMPTION FROM EARNEST MONEY DEPOSIT:**

   • **Micro and Small Enterprises** registered with District Industries Centers or Khadi and
     Village Industries Commission or Khadi and Village Industries Board or Coir Board or
     National Small Industries Corporation or Directorate of Handicrafts and Handloom or any
     other body specified by Ministry of Micro, Small and Medium Enterprises, are exempted
     from payment of Earnest Money provided -

   • Vendors have to upload the necessary documents as mentioned above to claim
     exemption for Earnest Money Deposit.
5. **EMD FOREFEITURE AND RETURN OF EMD:**

- EMD submitted shall be returned on finalization of the order. No interest on this EMD is payable.

- **EMD will be forfeited in the event of:**
  - Withdrawal of offer while the offer is under consideration during the offer validity period.
  - Bidder not accepting our Purchase Order, if placed without prejudice to our rights to recover damages on account of breach of contract.
  - Non-confirmation of acceptance of order within the stipulated time after placement without prejudice to our rights to recover damages on account of breach of contract.
  - Any unilateral revision made by the Bidder during the validity period of the offer.

This is a **TWO-PART-BID** Tender. Bidders are requested to submit / upload their UNPRICED & PRICED BIDS, on or before the due date by 14.00hrs, on BPCL E-Procurement website https://bpcleproc.in maintained by M/s ETL (E-procurement Technologies Ltd.).

For any assistance regarding online submission of bids on BPCL E-Procurement web site, bidders may contact Mr. Nigam on Tel No. 9768298601 or Mahendra on Tel No. 9920038902 or 022-2554 0717 on all working days (Mon - Fri) between 09.00 hrs to 17.00 hrs. or helpdesk of M/s. E-procurement Technologies Ltd.) on Telephone no. 022 65354113, 022 65595111 between 09.30 hrs to 18.30 hrs.

6. The Techno-Commercial / Unpriced Bids shall be opened on **29.08.2016 at 14:00 hours**

**PART - A: QUALIFICATION CRITERIA & TECHNO-COMMERCIAL (OTHER THAN PRICE) BID**

The attached tender document consists of the following Attachments:

- BID-QUALIFICATION CRITERIA.
- TECHNICAL DETAILS.
- SCHEDULE OF ITEMS.
- BRIEF SCOPE OF WORK.
- BRIEF SPECIFICATION.
- GENERAL SCOPE FOR GRIHA.
- DETAILED SCOPE OF WORK.
- SPECIAL CONDITIONS OF CONTRACT
- GENERAL CONDITIONS OF CONTRACT.
- GENERAL TERMS AND CONDITIONS.
- SPECIAL SAFETY CONDITIONS.
- FINANCIAL DETERRENT FOR VIOLATION.
- POLICY FOR HOLIDAY LISTING.
- INTEGRITY PACT.
- QEHS & ENERGY POLICY.
- BG FORMAT FOR EMD.
- PAYMENT SCHEDULE.

- Information pertaining to Bid Qualification, Technical, Techno-commercial & Other Details shall be filled, signed, stamped and uploaded on BPCL e-procurement website under respective categories.
PART - B: PRICE BID.

- Vendors have to submit Prices directly on the e-procurement website.

7. All the tender documents shall be required to be duly signed and stamped the authorized signatory. The authorized signatory shall be:

   a) Proprietor in case of proprietary concern.
   b) Authorized partner in case of partnership firm.
   c) Director, in case of a limited Company, duly authorized by its board of directors to sign.

OPENING OF BIDS: This being Two-Part-Bid, the Qualification Criteria and Techno-Commercial Bid will be opened first and evaluated. Bidder to note that qualification of bidder and evaluation of bid is being taken up simultaneously and therefore issue of TQ/CQ and or Techno-commercial discussions shall not be construed as the bidder is qualified.

PRE-BID MEETING: A pre-bid meeting has been arranged for all the interested bidders on 22.08.2016 11:00 hrs at below mentioned address. Bidders are requested to inform the concerned person in advance the details of persons visiting our office along with the authorization letters.

Conference Room, Estates Dept.
3rd Floor, South Block, Admin Bldg.
Bharat Petroleum Corporation Limited,
Mahul, Mumbai 74

Please contact Mr. Navanath Ingale on 2599 6561 or Mr. Raviraj Devalkar on 022 2553 3383.

8. The vendors who are on BPCL’s Black /Holiday List will not be considered.

9. BPCL reserves the right to accept/ reject any or all the Offers at their sole discretion without assigning any reason whatsoever.

10. BPCL decision on any matter regarding Bid qualification of vendors shall be FINAL and any vendor shall not enter into correspondence with BPCL unless asked for.

11. BPCL would also consider information already available with them regarding Vendor’s Credentials.

12. BPCL may call for additional documents if required.

13. Bidders may raise disputes/complaints, if any, with the nominated Independent External Monitor (IEM). The IEM's name, address & contact number is given below:

   Shri. Brahm Dutt
   A-1/8 Safdarjung Enclave,
   New Delhi - 110 029.
   Mail: dutt.brahm@gmail.com
   Mobile no: 09871920282

16. For clarifications, if any, please feel free to contact undersigned on 022-25533285 on any working day between 09:00 am to 4:00 pm.
BIDDERS QUALIFICATION CRITERIA:

The bidders who intend to participate in the tendering process shall meet all the following minimum requirements and only such bidders shall be pre-qualified for techno-commercial evaluation of the offers.

1. **Technical / Financial Criteria:**

1.1 The bidder should have completed the job of Construction of Multistorey Residential Building (at least Ground/Stilt+18 Storey or Minimum 19 Storey above the ground) with RCC Framed structure including Civil, Plumbing and Electrical works during last 7 years ending last day of the month previous to the one in which applications are invited should be either of the following:-

- The bidder should have successfully completed at least 3 similar jobs with each project cost of value not less than Rs. 9.5 crores excluding the cost of land.
  
  **OR**
  
- The bidder should have successfully completed at least 2 similar jobs with each project cost of value not less than Rs. 12 crores excluding the cost of land.
  
  **OR**
  
- The bidder should have successfully completed at least 1 similar jobs with each project cost of value not less than Rs. 19 crores excluding the cost of land.

**Note:-**

i) Completion of job means the bidder should provide completion certificate from client/owner and Occupation Certificate (OC) issued by Local Authority. Both certificates are essential for considering the bidder for pre-qualification. Date of OC should fall in the above mentioned seven preceding years for pre-qualification.

ii) Construction of hostel buildings/studio apartments etc. and buildings other than residential type shall not be considered for pre-qualification.

1.2 The average annual turnover of the bidder during the preceding three financial years ending up to 31st March 2015 shall be minimum Rs. 7 crores.

1.3 Net worth of the bidder shall be positive as per latest audited annual report.

1.4 The bidder should have executed the above work in Municipal Corporation of Greater Mumbai (MCGM)/ Navi Mumbai Municipal Corporation (NMMC)/ Thane Municipal Corporation (TMC) city limits.

1.5 The bidder shall not be on Holiday list or serving banning order or blacklisted by BPCL or MOP & NG or any PSE or State/Central Govt Organizations or any other local Municipal Body or Corporations (Like MCGM, NMMC, TMC etc.) in India. Also, the bidder should not have faced/facing any criminal/civil proceedings or any litigation/investigations of CBI/SIT/Police/any Govt agencies pertaining to any activity of construction works including challenge to any order of putting it on Holiday list or banning order or blacklisting order against their Firm /Directors / Employees except for cases where the Firm/Directors/ Employees have been finally acquitted or the order putting it on Holiday list or banning order or blacklisting order have been finally set aside by any competent Court. Bidder shall submit declaration in this regard."

1.6 BPCL shall reserve the right to visit the sites of the completed jobs of bidders to ascertain the capability/ Quality of works executed in the last seven years.
The bidder shall submit following documents along with Pre Qualification bid:

I. Company profile indicating organization structure of bidding entity.
II. Audited Profit and Loss account and Signed Balance sheet, Income Tax Returns for latest three preceding financial years ending up to 31st March 2015.
III. Attested Contract/Purchase order copies with final executed value for documentary proof of having executed projects as laid down in Prequalification Criteria (As applicable). Name of clients with contact details like telephone nos. / email / fax nos./contact person's name.
IV. Attested copies of Work completion certificates, Occupation certificates.
V. Additional credentials if any related to the construction of green buildings/high rise structures.

1.7 It shall be the sole discretion of BPCL to shortlist the bidders & BPCL decision shall be final
BRIEF TENDER NOTICE

Bharat Petroleum Corporation Limited, Mumbai Refinery invites sealed tenders for the work described below:

i) Name of Work :- Construction of Multistorey Residential Tower Building at BPCL Staff Colony, Aziz-baug, Chembur, Mumbai- 400 074


iii) Details of the Project:- As per Tender documents and Drawings

Total Built up Area for Construction: - 7933.92 square meters

<table>
<thead>
<tr>
<th>Floors</th>
<th>Built up area for Construction including refuge(Sqm)</th>
<th>Refuge area at Mid Landing (sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground</td>
<td>120.12</td>
<td>------</td>
</tr>
<tr>
<td>1st</td>
<td>417.67</td>
<td>------</td>
</tr>
<tr>
<td>2nd</td>
<td>417.67</td>
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<tr>
<td>3rd</td>
<td>417.67</td>
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<tr>
<td>4th</td>
<td>417.67</td>
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<td>5th</td>
<td>417.67</td>
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<tr>
<td>6th</td>
<td>417.67</td>
<td>------</td>
</tr>
<tr>
<td>7th(Refuge)</td>
<td>451.14</td>
<td>33.40</td>
</tr>
<tr>
<td>8th</td>
<td>417.67</td>
<td>------</td>
</tr>
<tr>
<td>9th(Refuge)</td>
<td>451.14</td>
<td>33.40</td>
</tr>
<tr>
<td>10th</td>
<td>417.67</td>
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<td>451.14</td>
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<td>451.14</td>
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<tr>
<td>14th</td>
<td>417.67</td>
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<tr>
<td>15th(Refuge)</td>
<td>451.14</td>
<td>33.40</td>
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<tr>
<td>16th</td>
<td>417.67</td>
<td>------</td>
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<tr>
<td>17th (Refuge)</td>
<td>451.14</td>
<td>33.40</td>
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<tr>
<td>18th</td>
<td>417.67</td>
<td>------</td>
</tr>
<tr>
<td>Terrace (Enclosed Area)</td>
<td>94.92</td>
<td>------</td>
</tr>
<tr>
<td>Total</td>
<td>7933.92</td>
<td>200.40</td>
</tr>
</tbody>
</table>

Note:-
Built up area note:-

1. Built up area for Ground floor is considered only for enclosed portions.
2. Underground tanks, pump room, Over head tanks, Lift machine room shall not be considered under Built up area in the above table.
3. Refuge slab at terrace level is not considered under Built up area.
4. Total area for Stilt parking, Underground tanks, pump room, Overhead tanks, Lift machine room is approx. 430 Sq.mt.

Tenderer should consider the above while quoting the rates.

Above Built Up Area is calculated on the basis of drawings and same has been indicated on the drawings. The tenderer shall fully satisfy himself regarding accuracy of Built – Up Areas. Discrepancy, if any shall be brought to the notice of Bharat Petroleum Corporation Ltd at the time of Pre-Bid meeting. If this is not done, then it will be presumed that the area mentioned in the tender and tender drawings is acceptable to the tenderer for payment purpose. No extra payment/deductions shall be made for variations of (±) 1% in the Built-Up area.

Contractor has to construct Residential Building for Bharat Petroleum Corporation Ltd, (Ground+18 Storey, 36 flats) at BPCL Staff Colony, Azizbaug, Chembur, Mumbai as per drawings, specification, scope of work & other conditions and Terms of contract as per Green Building norms laid down by GRIHA for achieving 4-star rating.

All items of work, part of work or work itself shown either on the drawings or mentioned in the tender document or vice versa are to be executed by the contractor. Non appearance of any of the item either in the drawings or in the tender or vice versa shall not vitiate the purpose for which the building shall be constructed.

BRIEF SCOPE OF WORK

The brief scope of work includes the below items:-

1) Clearing of Site and Site Demarcation
2) Barricading the site area by using GI sheets supported suitably by MS Structures up to 6mt Height
3) Name Boards for safety and site development display
4) Surveying and levelling
5) Excavation and Top soil preservation
6) Anti-termite Treatment
7) PCC and soling
8) Backfilling and Compaction
9) RCC Substructure and Superstructure including staircase
10) Plinth beam and plinth area construction
11) Masonary in AAC Blocks
12) Internal and External plaster
13) Water supply including water meters, sewage disposal system, plumbing fittings and sanitary fixtures
14) Waterproofing of toilets, terrace, chajjas, balconies, refuge area, kitchen sunk and other sunk
areas etc.
15) Flooring, Bathroom and kitchen tiling
16) Wooden Doors, Anodised Aluminium windows, ventilators including locks and associated accessories
17) Storm water drainage
18) Rain water harvesting
19) Internal and external painting
20) Modular kitchen and wooden wardrobes in bedrooms and passage
21) Electrical Conduiting, Wiring, switchboards, Electrical Fittings & fixtures
22) Fire fighting wet riser, sprinkler, smoke detection system with DG Set, Fire extinguishers, exit signage, Sand Buckets etc. As per CFO NOC
23) Lifts with Machine room as per PWD norms
24) Roof top grid connected solar panel system
25) Underground and overhead tanks including fire water tanks with associated plumbing works
26) Telephone, DTH Cabling and data cabling works
27) Fire Pumps, Water Supply pumps, panels and pump room
28) Meter room, feeder pillar, main cabling, Earth pits, and Lightning arrester etc.
29) Stilt lighting, External lighting and electrical works
30) Area Development works up to the plot boundary
31) Glass Reinforced Concrete (GRC) works for duct areas and external part elevation
32) Site office, site laboratory, temporary store room, Construction Machineries, First aid box, safety material, sanitary facilities for labour, temporary lighting for site area while executing works, water supply arrangements.
33) Associated works related to GRIHA
34) Obtaining Statutory approvals as per tender

Above items are only indicative and for guidance & brief description of jobs, but should not be considered limited to this list. Tenderer should refer to the detailed tender documents and drawings for detailed items and scope of work included in this project. Any discrepancy in the above shall be brought to the notice of BPCL in the pre-bid meeting.
LIQUIDATED DAMAGES

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the Contractor(s). Start date of the project shall be from the date on which the order to commence work (Letter of Intent/ Purchase Order) is given to the Contractor(s).

The work shall throughout the stipulated period of the contract be proceeded with all due diligence (Time being deemed to be of the essence of the contract on the part of the contractor(s) and if the Contractor(s) makes/make default therein, he/they shall pay as compensation the sum which may be determined by following:

The contractor will have to prepare and submit a detailed bar chart in consultation with the Architect after issue of work order and further to ensure good progress of work during execution, the quantity of work (in financial term linked with billing of the project) to be done within specified time would be as follow:

1. Mobilisation within 1 month (30 days)
2. 25% of the work (in financial term) within 9 months
3. 40% of the work (in financial term) within 12 months
4. 70% of the work (in financial term) within 18 months
5. Building including all infrastructural works, amenities, Occupation Certificate along with P-Form, C form and physical water connection shall be completed in 26 (Twenty Six Months) Including Monsoon period.

In the event of the Contractor(s) failing to comply with the above progress in financial terms and any of these programs above, he/they shall be liable to pay as compensation an amount equal to 0.5 (one-Half) percent of the said contract value of the whole work for every week that the due quantity of work shall remain incomplete provided the amount to be recovered under this clause shall not exceed 5(Five) percent of the contract value as shown in the work order.
## SCHEDULE OF QUANTITIES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Unit Rate (Rs.)</th>
<th>Total Amount (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Construction of Multistorey Residential Tower Building comprising of 36 flats (Ground + 18 Storey) including all infrastructural works as mentioned in the Tender and Drawings</td>
<td>7933.92</td>
<td>Square metre</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Contractor has to work out his own quantities and estimate from the drawings provided and as per the tender details.

- No extra payment/deductions shall be made for variations of (±) 1% in the Built-Up area.
### SPECIFICATIONS

#### CIVIL

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Site Barricading :-</strong></td>
</tr>
<tr>
<td><strong>1.1</strong></td>
<td>Supply, fabricating and installing barricading work 6 meter height above ground level, with galvanised iron corrugated sheet of minimum 0.7mm TCT, on vertical mild steel ISMB150 size structural steel sections, embedded in cement concrete block of 1:2:4 mix of size 45 X 45 X 90D (10 to 15 above Ground, 75 to 80 below ground) cm, 2.5 m centre to centre with 4 No horizontal ISA50x50x5 section cladding runners (max spacing 1.83m) (10mm dia central sag rod if reqd) supporting the sheets, anchors etc. including all fitting etc. complete. Detailed design to be submitted prior to the commencement of work and approval from Architect-PMC/BPCL to be taken before execution.</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>Excavation :-</strong></td>
</tr>
<tr>
<td><strong>2.1</strong></td>
<td>Excavation for foundations, substructures, tanks, sumps, walls, chambers, manholes, trenches, poles, pits &amp; general building works in all types of soils, vegetable earth, soft murum, running sand, shingle, turf clay, loam, peat, ash, shale, slag, chalk, garbage, muddy/ marshy/ slushy soil, marine clay, reclaimed land etc. for depths/lifts upto 6.5m measured from the ground level, including dressing/ trimming the sides, leveling and ramming of bottoms, manual/mechnical dewatering, removing rank vegetation, preparation of bed for foundation etc. stacking the selected material in measurable heaps for future use within owners space or disposing within an initial lead of 150m / outside colony as directed, loading, unloading, leveling including shoring, strutting etc. complete as directed by Architect-PMC/BPCL. This shall also includes the handling/supporting the existing utilities such as cables, drains, pipes, water mains etc. It also includes the royalty and other taxes applicable if any.</td>
</tr>
<tr>
<td><strong>2.2</strong></td>
<td>Excavation for foundations, substructures, tanks, sumps, walls, chambers, manholes, trenches, poles, pits &amp; general building works in hard murum, ordinary rocks, Moderately weathered/Highly Weathered rock for depths/lifts from 2.5m and upto 7m measured from the ground level, including dressing/ trimming the sides, leveling and ramming of bottoms, manual/mechnical dewatering etc. stacking the selected material in measurable heaps for future use within owners space or disposing within an initial lead of 150m as directed, loading, unloading, leveling including shoring, strutting etc. complete as directed by Architect-PMC/BPCL. The rate includes the handling/supporting the existing utilities such as cables, drains, pipes, water mains etc. It also includes the royalty and other taxes applicable if any.</td>
</tr>
</tbody>
</table>
2.3 Topsoil removal, Stacking of Fertile Soil, preservation, conducting Soil Fertility Test as per GRIHA. Topsoil to be stripped to a depth of 200 mm from areas proposed to be occupied by buildings, roads, paved areas and external services. It is to be stockpiled to a height of 400 mm in designated areas and shall be reapplied to site during plantation of the proposed vegetation. Topsoil shall be separated from subsoil debris and stones larger than 50 mm diameter. During construction period soil to be either covered with plastic sheets or should have vegetative growth. The stored topsoil to be used as finished grade for planting areas after construction.

3 **Anti-Termite Treatment**

3.1 Providing Pre-constructional Anti-Termite Treatment conforming to IS - 6313 (part- II) using chloropyrifos EC 20 Emulsion or equivalent of 1% concentration by weight for creating barrier under and all around foundation pits, wall trenches, basement excavation, backfill in immediate contact with foundation and treating the top surface of plinth filling, junction of wall & floor, along the external perimeter of building, expansion joints, surrounding of pipes, water conduits and at places suggested and as directed by Architect-PMC/BPCL.

4 **Back-Filling**

4.1 Back-filling after foundation or at plinth or in low lying ground or any other required area in layers not more than 200mm thickness including breaking of clods, dressing to the required lines, curves, watering and consolidating each layer in filled up area by rolling and compacting with vibro roller not less than 10 MT & using other compacting equipment as required and as directed by Engineer-In-charge to achieve not less than 95% Modified Proctor density conforming to relevant IS with contractors murum or murum available on site and with dry trap/rubble stone soling using 150 mm to 200 mm size trap, metal, filling voids with sand / grit ramming, watering etc. The rate includes necessary soil testing charges at laboratory & field as per relevant I.S. codes, royalty, octroi and other taxes if any. Borrow areas selected by contractor shall be got approved from Architect-PMC/BPCL before executing the work.

5 **Soiling**

5.1 Supply & laying of 230mm thickness of soling using black trap stones in paving, below foundations, plinth area, in road works etc. including supply & filling interstices using stone chips, sand, stone dust & including watering, ramming, compacting, dressing to required slope & camber, etc. all complete.

6 **Plain Cement Concrete (PCC)**

6.1 Providing and laying of plain cement concrete with approved aggregate sizes for foundation, below plinth beams, plinth protection, flooring, walkway, copping, bed blocks, steps, risers, treads, planters, drains, Roads, Pavements and other structures etc. and at all locations and depth with Ready Mixed Concrete of grade M-20 including lead from manufacturer site to site of work, admixtures, mechanical conveying, placing in position, in position steel/plywood Centering & shuttering including strutting, propping etc. and removal of form work, mechanical compaction, finishing, curing, scaffolding etc. complete as per drawings and as directed by the Architect-PMC/BPCL.
| 6.2 | Providing and laying of cast-in-situ plain cement concrete with approved aggregate sizes for foundation, below plinth beams, plinth protection, flooring, walkway, copping, bed blocks, steps, risers, treads, planters, drains, Roads, Pavements and other structures etc. and at all locations and depth of grade M-20 including lead from manufacturer site to site of work, admixtures, mechanical conveying, placing in position, in position steel/plywood Centering & shuttering including strutting, propping etc. and removal of form work, mechanical compaction, finishing, curing, scaffolding etc. complete as per drawings and as directed by the Architect-PMC/BPCL. |

| 7 | **Reinforced Cement Concrete (RCC)** |

| 7.1 | Providing and laying of Reinforced cement concrete with approved mix design for foundation, columns, beams, slabs, plinth beams, parapet walls, tanks etc. and at all locations and depth with Ready Mixed Concrete of grade M-45 including lead from manufacturer site to site of work, admixtures, mechanical conveying, placing in position, in position steel/plywood Centering & shuttering including strutting, propping etc. and removal of form work, mechanical compaction, finishing, curing, scaffolding etc. complete as per drawings and as directed by the Architect-PMC/BPCL. This is including cover block as per require diameter. |

| 7.2 | Providing and laying of Reinforced cement concrete with approved mix design for foundation, columns, beams, slabs, plinth beams, parapet walls, tanks etc. and at all locations and depth with Ready Mixed Concrete of grade M-40 including lead from manufacturer site to site of work, admixtures, mechanical conveying, placing in position, in position steel/plywood Centering & shuttering including strutting, propping etc. and removal of form work, mechanical compaction, finishing, curing, scaffolding etc. complete as per drawings and as directed by the Architect-PMC/BPCL. |

| 7.3 | Providing and laying of cast-in-situ Reinforced cement concrete with approved mix design for lofts, pardis etc. secondary structural members and at all locations and depth with of grade M-40 including admixtures, mechanical conveying, placing in position, in position steel/plywood Centering & shuttering including strutting, propping etc. and removal of form work, mechanical compaction, finishing, curing, scaffolding etc. complete as per drawings and as directed by the Architect-PMC/BPCL. Note:-Design mix shall be as approved by the RCC consultant. W/C ratio shall be as per consultant’s recommendation- GRIHA norms for Green building to be followed, and min 15% Fly ash/material as prescribed by Consultant to use to replace cement as per norms, etc as per IS codes). The RMC manufacturer shall be as per the approved list provided along with the tender. |

| 8 | **Steel Reinforcement** |
| 8.1 | Providing and fixing HYSD/T.M.T. FE 500 Bars Reinforcement (Conforming to IS:1786) for all R.C.C. works at all levels including foundations, columns, beams, slabs, pardaies, parapets, pavements and Roads, which includes bends, hooks, laps, cover blocks of any form or design as per drawing and IS specifications and instructions of Structural Consultant/PMC/BPCL. This includes transporting, de-coiling, straightening, cutting, bending, cranking, welding and placing in position at all levels and binding with approved quality G.I. annealed binding wire, cover blocks or approved concrete cover blocks of same grade as of concrete. This shall also includes binding wire, chairs, spacers, pins etc. Quantity of steel as per bar bending schedule as approved by the structural consultant/Architect-PMC/BPCL. Further includes where required carryout dewatering, provide required labour and machines / equipments / tools / tackles for handling, shifting, bending, binding, etc. all complete to the satisfaction of the Structural Consultant/Architect-PMC/BPCL at all depths & leads. NO extra payment/measurement shall be given for overlapping, chair and wastage etc. |

| 9   | **Brick Work :-** |
| 9.1 | Providing and Laying 230mm Autoclaved Aerated Block (AAC) Masonry works in CM 1:4 conforming to IS:2185 for all types of masonry works at substructure, superstructure, drains, chambers etc. at all depths and heights including providing openings and projections, raking of joints, scaffolding and curing etc., complete as per specifications, drawings and direction of the Architect-PMC/BPCL. Blockwork should be laid on a layer 100mm thk Water Proof M20 concrete |
| 9.2 | Providing and Laying 150mm Autoclaved Aerated Block (AAC) Masonry works in CM 1:4 conforming to IS:2185 for all types of masonry works at substructure, superstructure, drains, chambers etc. at all depths and heights including providing openings and projections, raking of joints, scaffolding and curing etc., complete as per specifications, drawings and direction of the Architect-PMC/BPCL. This shall also includes providing and placing in position 2 Nos 8 mm dia M.S. bars at every third course of masonry work. Blockwork should be laid on a layer 100mm thk Water Proof M20 concrete |

| 10  | **Plaster :-** |
| 10.1 | Providing and applying 6 mm thick gypsum Internal ceiling plaster in single coat at all heights and locations by using suitable approved bonding agent for brickwork, concrete surfaces including hacking of concrete surface, scraping, watering, finishing, curing, scaffolding etc. complete finish the surface smooth in line and level to the entire satisfaction of Architect-PMC/BPCL complete. |
| 10.2 | Providing and applying 12 mm thick Internal wall plaster in two coats, one coat of 6-8mm thick in cement mortar 1:3 and second coat of 6mm thick gypsum plaster at all heights and locations for brickwork, concrete surfaces including hacking of concrete surface, scraping, watering, finishing, curing, scaffolding etc. complete. Finish the surface smooth in line and level to the entire satisfaction of Architect-PMC/BPCL complete. This is for all heights, depths, levels, leads and lifts and to include providing and fixing chicken wire mesh in junction RCC and brick walls and all chasing for electrical & plumbing conduits, pipes etc. |
Providing and applying 23 mm thick (average) External sand faced cement plaster for concrete and brickwork surfaces at all locations and heights in cement mortar 1:4 in two coats including providing water proofing compound to plaster, polypropylene/recron fibers as per manufacturers specification, racking out joints, hacking of concrete surface, providing bands, drip moulds, grooves etc. finishing, curing, scaffolding etc complete as directed By Architect-PMC/BPCL. This is for all heights, depths, levels, leads and lifts and to include providing and fixing chicken wire mesh in junction RCC and brick walls.

**10.3**

**Waterproofing :-**

11.1 Providing and laying damp-proof course 40 mm thick M-15 cement concrete layer and bitumen/waterproofing compound using cement of approved make as per the approved proportions etc. complete.

11.2 **Underground tank Waterproofing**

A Horizontal/Flat Side Waterproofing

1 Providing & laying of SBS modified self adhesive, fleece back waterproofing cum protection membrane over the bituminous primer. This shall includes Surface Preparation by cleaning work, removal of loose concrete and filling cracks with polymer modified mortar. Treatment of Rock Anchors points, protrusions and other projections as per manufacturers' recommendation.

2 Providing and laying of average 50 mm thick protection screed of M20 grade to protect the membrane from mechanical damages during reinforcement work after the application of membrane.

B Vertical Side/Walls Waterproofing

1 Providing & laying of SBS modified self adhesive, fleece back waterproofing cum protection membrane from positive side over the primed surface with suitable Primer. This shall includes Surface Preparation by cleaning work, removal of loose concrete and filling cracks with polymer modified mortar. Plug the tie rod holes with grouting compound. Making of angle fillets all around the periphery of the wall with polymer modified mortar. All the construction joints needs to be opened and treated with polymer modified mortar.

2 Providing & installation of aluminum termination bar & shall be fixed with non corrosive fastener @ 4 nos per rm. Sealing of termination bar with Dr. Fixit Sealant

11.3 **Terrace Waterproofing**

A Hardscape Portion-Horizontal Surface (Terrace slab)

1 Supplying and applying instant setting spray applied polyurethane waterproofing system @ 10 mm thick as per the manufacturer's recommendations, with 10 years composite warranty against leakages, to be provided by the principal manufacturer. This shall includes surface preparation including final cleaning of the surface, treating of construction joints, filling of honeycombs, sealing of voids by grouting, etc

2 Providing and applying polymer based single component liquid applied flexible and elastomeric spray / brush applied, water based with low VOC, should pass crack bridging, resistance to puncture as per ASTM standards, waterproof coating to be applied with a total consumption as per manufacturer's recommendation, and thereafter carrying out pond test for testing watertightness. Over and above loosely lay 150 GSM Geotextile (non-woven polyester) with a min of 150mm wide overlap.
<p>|   | Providing and laying protective screed of M20 grade with slope 1:100 containing 12 mm, 100% virgin polypropylene fibers @ 0.9 Kg per Cu.m with a broom finish, well compacted, curing for 7 days etc. complete. The screed shall be laid in panels with 10mm wide construction joint and filling the panel joints with polysulphide sealant. All around on the roof, at the parapet wall junction, an angular fillet 50mm x 50mm shall be trowel applied in cement-sand mortar 1:3 proportion. |
|   | Supplying &amp; Placing of 25mm Thick China mosaic tiling (overall thickness), under layer of 19 mm thick (compacted) in cement mortar (1:3) and top layer 6mm thick with china mosaic tile laid over the slurry made with white cement to fix and surface examined and cleaned, joints flush pointed with white cement and cured for 7 days by keeping it wet etc., complete and finished in all respect over the roof of all buildings at all levels and locations without damaging the elastomeric water proofing layer already done. |
| B | <strong>Landscape Portion-Horizontal Surface (Terrace slab)</strong> |
|   | Supplying and applying instant setting spray applied polyurethane waterproofing system @ 10 mm thick as per the manufacturer’s recommendations, with 10 years composite warranty against leakages, to be provided by the principal manufacturer. This shall includes Surface preparation including final cleaning of the surface, treating of construction joints, filling of honeycombs, sealing of voids by grouting, etc. |
|   | Provide and apply a single component PU based cold applied seamless waterproofing cum anti-root membrane, Apply 2 coats to achieve a DFT of approx 1.5 mm. The membrane shall be terminated 300mm above soil filling level / FFL. Over and above loosely lay 150 GSM Geotextile (non-woven polyester) with a min of 150mm wide overlap. |
|   | Laying protective screed of M20 grade with slope 1:100 containing 12 mm, 100% virgin polypropylene fibers @ 0.9 Kg per Cu.m with a broom finish, well compacted, curing for 7 days etc. complete. The screed shall be laid in panels with 10mm wide construction joint and filling the panel joints with polysulphide sealant, Dr. Fixit Pidiseal PS. All around on the roof, at the parapet wall junction, an angular fillet 50mm x 50mm shall be trowel applied in cement-sand mortar 1:3 proportion. |
|   | (Over the screed) Supply and installation of Rolled Matrix Soil Filter cum surface drainage System as per manufacturers specifications consist of dimple raised, moulded polypropylene sheet bonded to a high strength polypropylene geotextile fabric. This geotextile fabric composite allows passage of moisture through fabric while preventing fine soil from entering to drainage channel and has a compressive strength of 600 Kg/Sq.Mt. and thickness of 11mm. |
| 11.4 | <strong>Bathroom waterproofing</strong> |</p>
<table>
<thead>
<tr>
<th></th>
<th>Supplying &amp; sealing the Sanitary pipe inserts, electrical fit-outs, etc provided in the floor &amp; walls with 1.5 mm thick two sided non-reinforced polymerized bituminous self adhesive Bathseal Tape to seal the joint between pipes/inserts and the core cuts. The gaps around the pipe / inserts with to be filled with a non shrink cementitious waterproof grout. The “Nahani” trap, etc is to be fitted securely in the same manner &amp; the gaps around it to be grouted with non shrink Grout. This shall includes cleaning work, removal of loose concrete and filling cracks with polymer modified mortar, making of angle fillets all around the periphery of the wall with polymer modified mortar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Supplying &amp; applying 2 coats of Bathseal WPC in the slab areas &amp; extending it up to 150mm above the finished floor level. Extend the coating in shower splash zone (1.5m wide x 1.8m high). This includes laying of a 150mm wide strip of an open woven glass fiber mesh over the angle fillets on the 1st coat while it is still wet.</td>
</tr>
<tr>
<td>3</td>
<td>Providing and laying Brick Bat Coba for sunken portion and filling to to provide slope as specified including IPS over it of minimum 20mm thickness.</td>
</tr>
<tr>
<td>4</td>
<td>Supplying &amp; laying a waterproof plaster at horizontal &amp; vertical portion in 15 mm thickness in Sand Cement mortar admixed with waterproofing compound to both vertical &amp; horizontal surface.</td>
</tr>
<tr>
<td>11.5</td>
<td><strong>Balconies</strong></td>
</tr>
<tr>
<td>1</td>
<td>Supplying &amp; sealing the pipe inserts, electrical fit-outs, etc provided in the floor &amp; walls with 1.5 mm thick two sided non-reinforced polymerized bituminous self adhesive Bathseal Tape to seal the joint between pipes/inserts and the core cuts. The gaps around the pipe / inserts with to be filled with a non shrink cementitious waterproof grout. The “Nahani” trap, etc is to be fitted securely in the same manner &amp; the gaps around it to be grouted with non shrink Grout.</td>
</tr>
<tr>
<td>2</td>
<td>Providing &amp; applying 2 coats of waterproof coating with high performance two component pre-packed cementitious waterproofing coating, with a mix ratio of (liquid: Powder), parts by wt. - 1:1.4, @ 1 sqm / Kg / coat over the bottom slab and raising it to the wall as per the manufacturers’ specification &amp; drawing. All the coats to be applied in right angle to each other. This includes sprinkling of sand over the second coat. This shall also includes surface preparation by cleaning work, removal of loose concrete and filling cracks with polymer modified mortar. Making of angle fillets all around the periphery of the wall with polymer modified mortar</td>
</tr>
<tr>
<td>3</td>
<td>Supplying and Laying of Waterproof plaster in 15 mm thickness in Sand Cement mortar admixed with with waterproofing compound. Laying of protective screed of M20 grade to required slope.</td>
</tr>
<tr>
<td>11.6</td>
<td><strong>Refuge areas</strong></td>
</tr>
<tr>
<td>1</td>
<td>Opening the construction joints, cleaning and treating them with polymer modified mortar. Compressed air cleaning has to be done so as to make the surface free of dust, debris, laitance etc. Repairing cracks by cutting and making V-groove in 25x25 mm, with polymer modified mortar. Filling the groove with CM(1:3) mixed with polymer 10% by weight of cement. Making of angle fillets all around the periphery of the wall and floor junction with polymer modified mortar with cement: sand.</td>
</tr>
<tr>
<td></td>
<td><strong>Providing and applying 2 coats of high performance two component cementitious waterproofing coating @ 0.5 sqm / Kg extending the coat up to 150mm on the wall including laying of a 150mm wide strip of an open woven glass fiber mesh over the angle fillets on the 1st coat while it is still wet.</strong></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td><strong>Laying of protective screed of M20 grade to required slope maintaining minimum thickness of 40mm all over.</strong></td>
</tr>
</tbody>
</table>

**11.7 Lift Shafts**

<table>
<thead>
<tr>
<th></th>
<th><strong>Opening the construction joints, cleaning and treating them with polymer modified mortar, cement: sand. Surface preparation by compressed air cleaning has to be done so as to make the surface free of dust, debris, laitance etc. Repairing cracks by cutting and making V-groove in 25x25 mm, with polymer modified mortar. Filling the groove with CM(1:3) mixed with polymer 10% by weight of cement. Making of angle fillets all around the periphery of the wall and floor junction with polymer modified mortar with cement: sand.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>For Lift shafts:</strong> <strong>Providing &amp; applying to the entire wall of lift shaft with 2 coats of high performance two component cementitious waterproofing coating @ 0.5 sqm / Kg including laying of a 150mm wide strip of an open woven glass fiber mesh over the angle fillets on the 1st coat while it is still wet.</strong></td>
</tr>
<tr>
<td>2</td>
<td><strong>Protection for bottom slab of lift shaft:</strong> <strong>Laying of protective screed of M20 grade to required slope with minimum thickness of 40mm.</strong></td>
</tr>
<tr>
<td>3</td>
<td><strong>Protection for Lift shaft wall:</strong> <strong>Laying of protective plaster in 15 mm thickness in Sand Cement mortar admixed with Waterproofing compound.</strong></td>
</tr>
</tbody>
</table>

**11.8 Overhead Water Tank**

**A Internal Area**

<table>
<thead>
<tr>
<th></th>
<th><strong>Providing construction joint treatment with polymer modified mortar. Supplying &amp; sealing the pipe inserts, electrical fit-outs, etc provided in the floor &amp; walls with 1.5 mm thick two sided non-reinforced polymerized bituminous self adhesive Bathseal Tape to seal the joint between pipes/inserts and the core cuts. The gaps around the pipe / inserts to be sealed with Bathseal Grout, a non shrink cementitious waterproof grout. The “Nahani” trap, etc is to be fitted securely in the same manner &amp; the gaps around it to be grouted with non shrink Grout. This shall also includes surface preparation by cleaning works, removal of loose concrete, laitance, dust particles, etc &amp; further ponding the slab to identify the leak/weak spots &amp; carrying out injection grouting using ready to use waterproofing compound or equivalent non-shrink grouts, proper coving between slab and wall junctions with polymer mortar as per manufacturer’s recommendation etc. Complete.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Providing &amp; Applying 2 coats of waterproof coating with high performance two component pre-packed cementitious waterproofing coating, with a mix ratio of (liquid: Powder), parts by wt. - 1:1.4 @ 1 sqm / Kg / coat over the bottom slab and raising it to the wall as per the manufacturers’ specification &amp; drawing. All the coats to be applied in right angle to each other. Providing &amp; applying 2 coats of water-based epoxy coating @ 8 sqm / Kg / coat.</strong></td>
</tr>
<tr>
<td>2</td>
<td><strong>External Area (Wall &amp; Top slab)</strong></td>
</tr>
</tbody>
</table>
**Surface Preparation:**
Cleaning the surface, removing the laitance, grease, old paints, contaminants, curing compound with wire brush / grit blasting. Cleaning the surface with compressed air. Damaged or loose concrete to be replaced & repaired with polymer modified mortar. Small cracks needs to be repaired with crack filling material.

2
Providing & applying primer for the exterior coating composed of acrylic emulsion polymer, properly selected fine fillers, white pigments & additives in water as a medium.

3
Providing & applying two coats of UV stable, weatherproof, anti-fungal coating with crack bridging capacity to attain a suitable DFT with due treatments at the external walls.

<table>
<thead>
<tr>
<th>12</th>
<th>Painting</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Internal Painting</td>
</tr>
<tr>
<td>1</td>
<td>Providing and applying Two coats of Acrylic Distemper paint to the walls inside the building over a coat of approved primer, after scrapping, brushing, cleaning, including filling of voids and cracks and making the surface even by filling putty etc. complete. including scaffolding</td>
</tr>
<tr>
<td>2</td>
<td>Providing and applying Two coats of synthetic enamel paint of approved colour and brand to structural steel works and wood works over a coat of approved primer in building, after scrapping, brushing, cleaning, including filling of voids and cracks and making the surface even by filling putty etc. complete including scaffolding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>External Painting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Providing and erecting at site conventional Steel Double scaffolding for external painting to reach at place of work on the external facade of the building including approaches, extensions, working platforms, ladders, lifting tackle for men and materials etc. all complete, inclusive of covering by Hessian cloth or tarpaulins, dismantling of scaffolding and taking away all materials after the completion of proposed work etc. all complete.</td>
</tr>
<tr>
<td>2</td>
<td>Surface preparation: Cleaning the surface, removing the laitance, grease, contaminants, curing compound with wire brush / grit blasting. Cleaning the surface with compressed air. Damaged or loose concrete to be replaced &amp; repaired with polymer modified mortar. Small cracks needs to be repaired with crack filling material.</td>
</tr>
<tr>
<td>3</td>
<td>Providing &amp; applying primer for the exterior coating composed of acrylic emulsion polymer, properly selected fine fillers, white pigments &amp; additives in water as a medium.</td>
</tr>
<tr>
<td>4</td>
<td>Providing &amp; applying two coats of UV stable, weatherproof, anti-fungal coating with crack bridging capacity to attain a suitable DFT with due treatments at the external walls.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13</th>
<th>Flooring and Dado</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Providing and laying rectified and vitrified tiles of size 800 X 800 x 8 mm to 10mm thick of approved make, shade and pattern for flooring &amp; Skirting in required position laid on a bed of 1:4 cement morter including neat cement float,filling joints with cement slurry,curing and cleaning etc.complete.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>Providing and laying Anti skid Coloured ceramic tiles of size 800mm x 800mm and above 6 to 8 mm thick for flooring &amp; Skirting in required position laid on bed of cement morter 1:4 including neat cement float, filling joints with neat cement slurry, curing and cleaning complete.</td>
</tr>
<tr>
<td>3</td>
<td>Providing and laying Anti skid Coloured ceramic tiles of size 300mm x 300mm and above 6 to 8 mm thick for flooring in required position laid on bed of cement morter 1:4 including neat cement float, filling joints with neat cement slurry, curing and cleaning complete.</td>
</tr>
<tr>
<td>4</td>
<td>Providing and laying colour ceramic tiles of size 600mm x300mm and above 6 to 8 mm thick for dado and skirting in required position fixed on plaster of cement morter 1:4 including neat cement float, filling joints with neat cement slurry, curing and cleaning complete.</td>
</tr>
<tr>
<td>5</td>
<td>Providing and laying polished kotah stone slab 20 to 25 mm thick for treads &amp; riser of steps &amp; staircases, in one piece with rounded nosing &amp; graving three lines for trades on bed of 1:4 cement mortar including neat cement float, filling joints with neat cement slurry, curing, polishing &amp; cleaning etc. complete.</td>
</tr>
<tr>
<td>6</td>
<td>Providing and laying polished kotah stone for Staircase landing of approved quality 20 to 25 mm thick plain/diamond pattern on a bed of cement mortar on bed of 1:4 cement mortar including neat cement float, filling joints with neat cement slurry, curing, polishing &amp; cleaning etc. complete.</td>
</tr>
<tr>
<td>7</td>
<td>Providing 25 to 30 mm thick partitions of both side polished Black Kadappa Stone slab of approved shape and quality and colour including holes of required size in appropriate place to receive pipes fixing in cement mortar 1:4 including providing and filling joints, curing, cleaning etc. complete.</td>
</tr>
<tr>
<td>8</td>
<td>Providing and fixing black/any other approved colour Granite Stone 15mm to 18mm thick machine cut, machine polish, cutting, rounding corner, groove on edge, laying in position, with neat cement slurry, on cement mortar bedding in CM 1:4 proportion, curing, etc. complete for Kitchen,Toilet door frames, staircase risers, treads and landing, wash basin counter etc. areas as per drawing.</td>
</tr>
<tr>
<td>9</td>
<td>Providing and fixing black/any other approved colour Sandwitch Granite Stone 15mm to 18mm thick machine cut, machine polish, cutting, rounding corner, groove on edge, laying in position, with neat cement slurry, on cement mortar bedding in CM 1:4 proportion, curing, etc. complete for window framing etc. areas as per drawing.</td>
</tr>
<tr>
<td>10</td>
<td>Providing &amp; fixing machine cut mirror polished Marble slab of required size and about 15mm to 18mm thk. of approved quality for partition/storage on cement mortar 1:4 including neat cement float, filling joints, rounding and moulding the edges, curing rubbing &amp; polishing/ cleaning etc complete.</td>
</tr>
<tr>
<td>11</td>
<td>Providing and laying machine cut, machine mirror polished, 16 mm thick Italian Marble stone flooring laid in required design (geometrical, curvilinear, abstract etc.) and in patterns in combination with Italian marble stones of different colours, shades and finished surface texture pattern, in linear as well as curvilinear portions of the building all complete as per the architectural drawings, laid over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with white cement slurry @ 4.4 kg/sqm including pointing with white cement slurry admixed with pigment to match the marble shade including rubbing, curing and mirror polishing etc. all complete as specified and as directed by the Architect-PMC/BPCL: 16 mm thick Italian Marble stone slab of Diana classic as per approved sample or equivalent.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing in the carriageway interlocking concrete pavers blocks, lacker finish of approve pattern and of approved colour as per technical specification 60mm thick, having average crushing strength 30 N/mm2 placed on average thickness of 65m uniformly graded river sand cushioning with properly compacted with mechanical compactor with required level grade and camber etc. complete as directed</td>
</tr>
<tr>
<td>13</td>
<td>Providing and laying 25 mm thick precast cement concrete chequered tiles of grade M-20 in ordinary grey cement without chips laid in cement mortar 1:3 over 50 mm thick cement concrete M-15 grade and 150 mm thick granular sub-base including pointing of tiles with neat cement as per drawing and Tech. Specification</td>
</tr>
<tr>
<td>15</td>
<td>Providing and fixing glass reinforced concrete jali (GRC) 50mm thk. As per the design of architects and Consultants including fixing to wall in cement:sand mortar all in perfect line and length complete</td>
</tr>
<tr>
<td>16</td>
<td>Providing and fixing 50 mm Thk precast cement concrete jali made in 1:2:4 and Min 6mm dia Mild steel including centering and shuttering, roughning, cleaning, fixing and finishing</td>
</tr>
<tr>
<td><strong>14</strong></td>
<td><strong>Doors and windows</strong></td>
</tr>
<tr>
<td>1</td>
<td>Providing and fixing C.P. teak wood/BTC Old frame 100mm x 75 mm for doors including all moulding, chamfering, rounding, rebating and with suitable holdfast in a cement concrete band including reinforcement and finishing with one coat of primer etc. complete.</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing position Indian teak wood hand rail of 100 x 75 mm as per detailed drawing or as directed by the Architect-PMC/BPCL. Including French polishing etc. complete.</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing factory made Solid core external water proof flush door in single leaf shutter 45mm thick, decorative type, of exterior grade, as per detailed drawing, or as approved face 1mm thk. laminate on both side venetians all necessary beads, moulding &amp; lipping with brass handles on both sides and finishing with French polishing etc complete. The door is to be complete with door Lock, handles, Stopper, Towerbolts, hinges etc. as per drawing</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing factory made Solid core flush door in single leaf shutter 35mm thick, External water proof of exterior grade, as per detailed drawing, or as approved face 1mm thk. laminate on both side venetians all necessary beads, moulding &amp; lipping with brass handles on both sides and finishing with French polishing etc complete. The door is to be complete with door lock, handles, Stopper, Towerbolts, hinges etc. as per drawing</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing fibre glass reinforced polyester (FRP) door shutter 35mm thick conforming to IS 14856 (2000) without ventilator including brass fixtures fastening etc. complete. (without door frame)</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing 25 mm thick marine plywood shutters for kitchen shutter including ISI marked hinges, frame, handles with necessary ss 304 screws as per drawing</td>
</tr>
<tr>
<td>7</td>
<td>Providing and fixing 25 mm and 12 mm thick marine ply for cupboards / wardrobes including drawers, ss rod, dressing mirror, ISI marked hinges, frame, handles with necessary ss 304 screws as per drawing</td>
</tr>
<tr>
<td>8</td>
<td>Providing and making kitchen storage units/kitchen shutters in 19 mm thick marine ply shutters with 1 mm thick laminates from outside and inside, glass, ss trolley, handle, hinges, frame with necessary screws etc. detailed as per drawing</td>
</tr>
<tr>
<td>10</td>
<td>Supplying &amp; Fixing in position coloured anodized extruded modular aluminium heavy section Glossy black Five Track sliding windows made up of Five track drain bottom section of size 152 x 32 x 1.3 mm thick (1.792 kg / Rmt ) and top and side section of 152 x 32 x 1.27 mm thick (1.523 kg / Rmt). The shutter should be of bearing bottom of size 45 x 18 x 1.29 mm thick (0.547 kg / RMT) Top member of size 40 x 18 x 1.29 mm thick (0.546 kg / RMT) &amp; shutter from SS Mosquito nets. Interlocking section size of 43 x 27 x 1.29 mm thick (0.547 kg / RMT) and handle section of size 43 x 18 x 1.29 mm thick (.547 kg / RMT) selected quality 6 mm thick GRIHA Approved glass to be fixed with neoprene gasket with approved quality PVC rollers necessary locks handles PVX linings and wooden encasement wherever necessary etc complete as directed by Architect-PMC.</td>
</tr>
<tr>
<td>11</td>
<td>Supplying &amp; Fixing in position coloured anodized extruded modular aluminium heavy section Glossy black Three Track sliding windows made up of details in line and proportion with above (Make Jindal) and selected quality 6 mm thick GRIHA Approved glass to be fixed with neoprene gasket with approved quality PVC rollers necessary locks handles PVX linings and wooden encasement wherever necessary etc complete as directed by Architect-PMC.</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing in position aluminium heavy section Glossy black coloured Anodised louvered windows / fixed partition / ventilators of various sizes with powder coating as per detailed drawings and specification including aluminium frame size 80 mm x 38 mm box type 5 mm thick sheet glass louvers clips / rubber plain PVC gaskets of approved quality etc complete equired size) of average weight of 0.30 kg/Rmt (or as required) with plain sheet glass 5.5 mm thick with neoprene gasket with hinges, locking arrangement and wooden encasement wherever necessary etc. complete. Sample to be got approved from Architect-PMC/BPCL.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
</tr>
<tr>
<td>13</td>
<td>Providing, fabricating and fixing in position Window Grills with Semidecorative MS grill work made out of MS square/round bars and MS flats as per design weighing approx. 20 kg/sqm with necessary screw lugs inserts, spot welding and one coat of red oxide primer etc. as detailed in drawing and as directed. Necessary grouting of supports to the RCC/Wall shall also be included in the item.</td>
</tr>
<tr>
<td>14</td>
<td>Supplying &amp; fixing stainless steel hand railing of grade 304 (16 gauge thick sections) with glossy finish at all levels including bending to required profile. Welding &amp; all required accessories &amp; labour etc complete. as per drawing.</td>
</tr>
</tbody>
</table>
### SPECIFICATIONS

#### PLUMBING

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Strom Water Drainage</td>
</tr>
<tr>
<td>1</td>
<td>Excavation in trenches for pipes, RCC drain and chambers upto required level in all soils other than soft and hard rock for depth upto 1.5 Meter from existing ground level including providing proper and adequate shoring, strutting, dewatering, Backfilling the trenches with selected excavated earth in layers not exceeding 150mm thick, watering, consolidating, compacting and disposing off surplus materials within the site, all complete as per specifications and directions of the Engineer-in-charge.</td>
</tr>
<tr>
<td>2</td>
<td>Providing, lowering and laying including supply of materials and labour RCC 150mm dia. NP2 class spun hume pipe of standards approved make for ground level work including with hemp yarn hot bitumen sand cement morter (1:1) joining, cutting pipes etc. all complete including giving satisfactory testing as per Requirements</td>
</tr>
<tr>
<td>3</td>
<td>Providing and laying 1:3:6 cement concrete for bedding, pipe supports and encasing the pipes, including necessary form work, compaction, curing de-watering, etc. All complete as per specifications and directions of the Engineer-in-charge.</td>
</tr>
<tr>
<td>4</td>
<td>Construction of RCC storm water channel/drain in RCC M-20 grade concrete up to a depth of 1000mm and width specified by local authorities. etc. including reinforcement, shuttering, centering/formwork as specified by RCC Consultant all complete as per specifications and drawings all as directed by the Engineer-in-charge.</td>
</tr>
<tr>
<td>5</td>
<td>Construction of storm water chambers for pipes of clear size 450 x 450mm upto depth of 1000mm with 230mm brick masonry in cement mortar 1:3, 125mm thick 1:3:6 cement concrete foundation, haunching and benching in 1:2:4 cement concrete, 1:3 water proof cement plaster 12mm thick both internal and external finished with floating coat of neat cement including D.I. heavy type grating with frame hinge type of size 450mm x 450mm, Grade A-15 weighing not less than 32kg NECO make fixed over 100mm thick R.C.C. coping 1:2:4 cement concrete provided with M.S. reinforcements of 10mm dia rods at 100mm centre both ways and including painting the grating with three coats of anti corrosive bitumastic paint testing all complete as per specifications for RCC pipes.</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing angle nozing for storm water channels fabricated out of M.S. Angle 50 x 50 x 6mm grouted in P.C.C. 1:2:4, including all complete and Providing and fixing D.I. gratings 40mm thick in short lengths of 600mm. 450mm wide x 600 mm long Grade A-15 (16 kg wt) (for Ground Level)</td>
</tr>
<tr>
<td>7</td>
<td>Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of 100mm thickness of required size by BPCL/PMC, reinforced with 8 mm dia bars as specified by RCC Consultant including perforations, providing edge binding with M.S. flats of required size complete, all as per direction of Engineer-in-charge. This shall be used for only non car park/no road areas as per direction of Engineer-in-charge.</td>
</tr>
<tr>
<td></td>
<td>Rain Water Drainage</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Providing and fixing in position lead flashing bell mouth inlets of 100mm dia. for rain water pipes on terrace.</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing in position C.I. dome shaped grating of 100mm dia.</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing in position rain water downtake of CCI pipes including all fittings like offsets, shoes, bends etc. including supporting on walls with clamps to keep the pipe away from the wall complete as specified including painting as per drawing</td>
</tr>
<tr>
<td>3.1</td>
<td>100mm dia.</td>
</tr>
<tr>
<td>3.2</td>
<td>75mm dia.</td>
</tr>
<tr>
<td>4</td>
<td>Excavation in trenches for pipes and chambers upto required level in all soils other than soft and hard rock for depth upto 1.5 Meter from existing ground level including providing proper and adequate shoring, strutting, dewatering, Backfilling the trenches with selected excavated earth in layers not exceeding 150mm thick, water filling, consolidating, compacting and disposing off surplus materials within the site, all complete as per specifications and directions of the Engineer-in-charge.</td>
</tr>
<tr>
<td>5</td>
<td>Providing, lowering and laying including supply of materials and labour RCC 150mm dia. NP2 class spun hume pipe of standards make including with hemp yarn hot bitumen sand cement mortar (1:1) etc. all complete including giving satisfactory including cutting the pipes</td>
</tr>
<tr>
<td>6</td>
<td>Providing and laying 1:3:6 cement concrete for bedding, pipe supports and encasing the pipes, including necessary form work, compaction, curing de-watering, etc. All complete as per specifications and directions of the Engineer-in-charge.</td>
</tr>
<tr>
<td>7</td>
<td>Constructing 600 x 600 size brick masonry rain water entrance chamber in 230mm thick brick wall in cement mortar 1:4 plastered inside and outside in C.M. 1:3 including 150mm thick bed concrete in C.C, 1:3:6 and 600 x 600 size C.I. heavy frame and C.I. grating</td>
</tr>
<tr>
<td>8</td>
<td>Providing and fixing C.P. Brass heavy quality gratings of 150mm round/square (3mm thick/SS) for floor drains including making necessary recessment grouting with neat cement all complete to the satisfaction and direction of the of the Engineer-in-charge.</td>
</tr>
<tr>
<td>9</td>
<td>Providing and fixing C.I. heavy approved quality deep seal Nahani Traps with minimum 40mm seal and of Size 100 x 75mm including fixing the same with the drip seal joints complete to the satisfaction and direction of the Engineer-in-charge.</td>
</tr>
<tr>
<td></td>
<td>Water Supply</td>
</tr>
<tr>
<td>1</td>
<td>Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot &amp; cold water supply, including all CPVC plain &amp; brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes &amp; fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc. The pipe sizes are as follows</td>
</tr>
<tr>
<td>1.1</td>
<td>15 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>1.2</td>
<td>32 mm nominal outer dia Pipes</td>
</tr>
</tbody>
</table>
Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings. This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. (External Work) The pipe sizes are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Providing and fixing below mentioned gun metal gate valve with C.I. wheel of approved quality (screwed end)</td>
</tr>
<tr>
<td>2.1</td>
<td>15 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>2.2</td>
<td>20 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>2.3</td>
<td>25 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>2.4</td>
<td>32 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>2.5</td>
<td>50 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>2.6</td>
<td>75 mm nominal inner dia Pipes</td>
</tr>
</tbody>
</table>

Providing and fixing ball valve (brass) 15 mm nominal bore of approved quality, High or low pressure, with plastic floats complete:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Providing and fixing below mentioned gun metal gate valve with C.I. wheel of approved quality (screwed end)</td>
</tr>
<tr>
<td>3.1</td>
<td>25 mm nominal bore</td>
</tr>
<tr>
<td>3.2</td>
<td>32 mm nominal bore</td>
</tr>
<tr>
<td>3.3</td>
<td>50 mm nominal bore</td>
</tr>
<tr>
<td>3.4</td>
<td>65 mm nominal bore</td>
</tr>
<tr>
<td>3.5</td>
<td>80 mm nominal bore</td>
</tr>
</tbody>
</table>

Providing and fixing gun metal non-return valve of approved quality (screwed end):

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Providing and fixing ball valve (brass) 15 mm nominal bore of approved quality, High or low pressure, with plastic floats complete</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing below details:</td>
</tr>
<tr>
<td>5.1</td>
<td>50 mm nominal bore</td>
</tr>
</tbody>
</table>

Providing and fixing PTMT Ball cock of 50 mm nominal bore, 242mm long, weighing not less than 1240 gms approved quality, colour and make complete with Epoxy coated aluminium rod with L.P./H.P.H.D. plastic ball:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Providing and fixing PTMT Ball cock of 50 mm nominal bore, 242mm long, weighing not less than 1240 gms approved quality, colour and make complete with Epoxy coated aluminium rod with L.P./H.P.H.D. plastic ball</td>
</tr>
<tr>
<td>7</td>
<td>Providing and fixing in position tested G.I. 'C' class pipe confirming to IS: 1239 with all fittings like bends, tees, reducers, elbows, unions etc. including supporting on walls with thick M.S. Clamps etc. complete including scaffoldings and hydraulic test of following sizes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>100mm dia. Having 114.3mm OD and 15.152 Kg. per Mt</td>
</tr>
<tr>
<td>7.2</td>
<td>80mm dia. Having 85.7mm OD and 11.6 Kg. per Mt</td>
</tr>
<tr>
<td>7.3</td>
<td>50mm dia. Having 60.3mm OD and 6.329Kg. per Mt</td>
</tr>
</tbody>
</table>

Providing insulation to concealed pipes by wrapping with K-flex insulation of 6mm with tapering all complete of below type. (for Concealed Pipe within Bathroom):

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Providing insulation to concealed pipes by wrapping with K-flex insulation of 6mm with tapering all complete of below type. (for Concealed Pipe within Bathroom)</td>
</tr>
<tr>
<td>9.1</td>
<td>15mm dia.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>9.2</td>
<td>20mm dia.</td>
</tr>
<tr>
<td>10</td>
<td>Providing and fixing brass screwed/flanged type mosquito proof grating for under ground suction tank over flow and vent of the following diameters.</td>
</tr>
<tr>
<td>10.1</td>
<td>65mm dia.</td>
</tr>
<tr>
<td>10.2</td>
<td>20mm dia.</td>
</tr>
<tr>
<td>11</td>
<td>Providing and fixing Pressure Reducing Valves (Full Bore Series) with filter / strainer arrangement as approved including fixing the same of the following diameters of below size(Varie Make)</td>
</tr>
<tr>
<td>11.1</td>
<td>32mm dia.</td>
</tr>
<tr>
<td>11.2</td>
<td>25mm dia.</td>
</tr>
<tr>
<td>11</td>
<td>Providing and fixing 20mm dia. Automatic (RB) air release valve including providing and fixing cut off &amp; drain valve, making necessary inlet/outlet connection and fixing with M.S. Brackets complete.</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing Cast Iron water tank covers with lock and patti arrangement frame including fixing the same complete as per detailed drawings and as per</td>
</tr>
<tr>
<td>12.1</td>
<td>600mm x 600mm (Double seal type 75 kg for Under Ground Tank)</td>
</tr>
<tr>
<td>12.2</td>
<td>600mm dia. (21 Kg weight for Over Head Tank)</td>
</tr>
<tr>
<td>13</td>
<td>Construction of valve chamber of clear size 450 x 450mm upto depth of 600mm with 230mm brick masonry in cement mortar 1:3,125mm thick 1:3:6 cement concrete foundation, haunching and benching in 1:2:4cement concrete, 1:3 water proof cement plaster 12mm thick both internal and external finished with floating coat of neat cement including C.I. heavy hinged type grating of size 900mm x 900mm weighing not less than 42 Kgs. fixed over 100mm thick R.C.C. coping 1:2:4 cement concrete provided with M.S. reinforcements of 10mm dia rods at 100mm centre both ways and including painting the grating with three coats of anti corrosive bitumastic paint testing all complete as per specifications</td>
</tr>
<tr>
<td>14</td>
<td>Providing and fixing in position water bars with screwed ends fabricated out of G.I. heavy class pipes of the following diameters including, welding of 5mm plate of required size painting with 3 coats of anti-corrosive paint all complete as per following details and detailed drawings</td>
</tr>
<tr>
<td>14.1</td>
<td>25mm dia. x 600mm long</td>
</tr>
<tr>
<td>14.2</td>
<td>40mm dia. x 600mm long</td>
</tr>
<tr>
<td>14.3</td>
<td>50mm dia. x 600mm long</td>
</tr>
<tr>
<td>14.4</td>
<td>65mm dia. x 600mm long</td>
</tr>
<tr>
<td>14.5</td>
<td>75mm dia. x 600mm long</td>
</tr>
<tr>
<td>14.6</td>
<td>100mm dia. x 600mm long</td>
</tr>
<tr>
<td>15</td>
<td>Providing and fixing in position water bars with flanged ends fabricated out of G.I./M.S. heavy pipes &amp; M.S. flanges table &quot;E&quot; of the following diameters, including weldingof 5mm plate of required size painging with 3 coats of ant corrosive paint all complete as per following details and detailed drawings</td>
</tr>
<tr>
<td>15.1</td>
<td>100mm dia. x 600mm long</td>
</tr>
<tr>
<td>15.2</td>
<td>150mm dia. x 600mm long</td>
</tr>
<tr>
<td>15.3</td>
<td>200mm dia. x 600mm long</td>
</tr>
</tbody>
</table>

**D Sanitary Fixtures & Fittings**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Providing and fixing Stainless steel kitchen sink - without drain board 470x420 mm bowl depth 178 mm (Nirali Make)</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing PTMT - Bottle Trap 38/40 mm (for Kitchen Sink) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing C.P. brass waste 40 mm (for Kitchen Sink) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing PTMT angle stop cock 15mm nominal bore, weighing not less than 85gms (for Kitchen) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with haardwood frame of approved make and shade with 6 mm thick hard board backing of size as per drawing</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing PTMT Towel Ring 215x200x37 mm (Make Jaquar)</td>
</tr>
<tr>
<td>7</td>
<td>Providing and fixing PTMT - Towel Rail (600 mm) (Make Jaquar)</td>
</tr>
<tr>
<td>8</td>
<td>Providing and fixing approved white vitreous china European water closet comprising of the following for complete installation. Making necessary inlet and outlet connection all complete. - Master Toilet</td>
</tr>
<tr>
<td>8.1</td>
<td>Providing and fixing European water closet white heavy Wall Hung 'P' trap type of approved quality commode seat and cover with CP brass hinges, rubber bushes. (Make Hindware Lara)</td>
</tr>
<tr>
<td>8.2</td>
<td>Providing and fixing 32mm dia. Dual type flush valve, flush pipe &amp; bend (Make Jaquar FLV-CHR-1085 / 1085 SQ)</td>
</tr>
<tr>
<td>8.3</td>
<td>Providing and fixing 15mm dia. CP 2 way bib cock with wall flanges (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>8.4</td>
<td>Providing and fixing Hand Shower (Health Faucet) 1 Mt. flexible tube) (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>9</td>
<td>Providing and fixing approved white vitreous china European water closet comprising of the following for complete installation. Making necessary inlet and outlet connection all complete. - Guest Toilet</td>
</tr>
<tr>
<td>9.1</td>
<td>Providing and fixing European water closet white heavy Wall Hung 'P' trap type of approved quality commode seat and cover with CP brass hinges, rubber bushes. (Make Hindware Enigma)</td>
</tr>
<tr>
<td>9.2</td>
<td>Providing and fixing 32mm dia. Dual type flush valve, flush pipe &amp; bend (Make Jaquar FLV-CHR-1085 / 1085 SQ)</td>
</tr>
<tr>
<td>9.3</td>
<td>Providing and fixing 15mm dia. CP 2 way bib cock with wall flanges (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>9.4</td>
<td>Providing and fixing Hand Shower (Health Faucet) 1 Mt. flexible tube) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>10</td>
<td>Providing and fixing approved white vitreous china Anglo indian water closet comprising of the following for complete installation. Making necessary inlet and outlet connection all complete. - Child Toilet</td>
</tr>
<tr>
<td>10.1</td>
<td>Providing and fixing approved white vitreous china Anglo indian water closet of approved quality commode seat and cover with CP brass hinges, rubber bushes. (Make Hindware Universal)</td>
</tr>
<tr>
<td>10.2</td>
<td>Providing and fixing 32mm dia. Dual type flush valve, flush pipe &amp; bend (Make Jaquar FLV-CHR-1085 / 1085 SQ)</td>
</tr>
<tr>
<td>10.3</td>
<td>Providing and fixing 15mm dia. CP 2 way bib cock with wall flanges (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>10.4</td>
<td>Providing and fixing Hand Shower (Health Faucet) 1 Mt. flexible tube) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Providing and fixing Matrix Set Material Code 70002 EWC (P-18). Wash Basin 46 x 36 CM. Wash Basin with one pair mounting brackets, EWC &amp; Cistern complete with fittings and seat cover. One No. hinged rail 76 cm &amp; 4 Nos. of Grab Rails 60 CM (Note: CP fixtures shall be Jaquar Continental &amp; Sanitary Fixtures shall be Make Hindware/Parryware) (for Handicap Toilet)</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing white vitreous china wash basins comprising of the following for complete installation. Making necessary inlet and outlet connection all complete.- Master Toilet</td>
</tr>
<tr>
<td>12.1</td>
<td>Providing and fixing Round top counter wash basin (Make : Hindware Inox)</td>
</tr>
<tr>
<td>12.2</td>
<td>Providing and fixing 32mm dia. CP waste coupling with chain plug (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>12.3</td>
<td>Providing and fixing 32mm dia.CP bottle trap with extension piece, CP wall flange complete. (1 Set) (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>12.4</td>
<td>Providing and fixing 15mm dia. CP heavy angle stop cock with wall flanges (2 No.) (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>12.5</td>
<td>Providing and fixing 15mm dia. CP heavy inlet connection pipe. (2 No.)</td>
</tr>
<tr>
<td>12.6</td>
<td>Providing and fixing 15mm dia. CP mixer tap heavy approved quality (1 No.) (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>13</td>
<td>Providing and fixing white vitreous china wash basins comprising of the following for complete installation. Making necessary inlet and outlet connection all complete.- Guest Toilet</td>
</tr>
<tr>
<td>13.1</td>
<td>Providing and fixing Rectangular top counter wash basin (Make: Hindware Solitaire)</td>
</tr>
<tr>
<td>13.2</td>
<td>Providing and fixing 32mm dia.CP waste coupling with chain plug (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>13.3</td>
<td>Providing and fixing 32mm dia.CP bottle trap with extension piece, CP wall flange complete. (1 Set) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>13.4</td>
<td>Providing and fixing 15mm dia. CP heavy angle stop cock with wall flanges (2 No.) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>13.5</td>
<td>Providing and fixing 15mm dia. CP heavy inlet connection pipe. (2 No.)</td>
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<tr>
<td>13.6</td>
<td>Providing and fixing 15mm dia. CP mixer tap heavy approved quality (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>14</td>
<td>Providing and fixing white vitreous china wash basins comprising of the following for complete installation. Making necessary inlet and outlet connection all complete.- Child Toilet</td>
</tr>
<tr>
<td>14.1</td>
<td>Providing and fixing Round Top counter type wash basin (Make:Hindware Crystal)</td>
</tr>
<tr>
<td>14.2</td>
<td>Providing and fixing 32mm dia. CP waste coupling (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>14.3</td>
<td>Providing and fixing 32mm dia. CP bottle trap with extension piece, CP wall flange complete (1 Set) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>14.4</td>
<td>Providing and fixing 15mm dia. CP heavy angle stop cock with wall flanges (2 Nos.) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>14.5</td>
<td>Providing and fixing 15mm dia. CP heavy inlet connection pipe. (2 Nos.)</td>
</tr>
<tr>
<td>14.6</td>
<td>Providing and fixing 15mm dia. CP mixer tap heavy approved quality (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>Providing and fixing white vitreous china wash basins comprising of the following for complete installation. Making necessary inlet and outlet connection all complete. (Dinning Area)</td>
</tr>
<tr>
<td>15.1</td>
<td>Providing and fixing Round Top counter type wash basin (Make: Hindware Tessa)</td>
</tr>
<tr>
<td>15.2</td>
<td>Providing and fixing 32mm dia. CP waste coupling with chain plug (1 No.) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>15.3</td>
<td>Providing and fixing 32mm dia. CP bottle trap with extension piece, CP wall flange complete. (1 Set) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>15.4</td>
<td>Providing and fixing 15mm dia. CP heavy angle stop cock with wall flanges (2 No.) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>15.5</td>
<td>Providing and fixing 15mm dia. CP heavy inlet connection pipe. (2 No.)</td>
</tr>
<tr>
<td>15.6</td>
<td>Providing and fixing 15mm dia. CP mixer tap heavy approved quality (1 No.) (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>16</td>
<td>Providing and fixing approved quality CP sink cocks (wall mounted Swivel type swan neck) including fixing the same with CP wall flanges, angle stop cock all complete. (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>17</td>
<td>Providing and fixing in position concealed type single lever operated Hot &amp; Cold bath mixture divertor with shower arm, shower head, bucket filler for complete installation. (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.1</td>
<td>Providing and fixing Divertor (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.2</td>
<td>Providing and fixing Single Lever Exposed Parts Kit: (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.3</td>
<td>Providing and fixing Hand Shower (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.4</td>
<td>Providing and fixing Shower Arm (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.5</td>
<td>Providing and fixing Overhead Shower (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.6</td>
<td>Providing and fixing Spout (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.7</td>
<td>Providing and fixing Flexible Tube (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.8</td>
<td>Providing and fixing Wall Bracket for Hand Shower (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>17.9</td>
<td>Providing and fixing Sliding Rail (Make Jaquar Alive Series)</td>
</tr>
<tr>
<td>18</td>
<td>Providing and fixing in position wall mixer 3 in 1 system with provision for bath hand shower and overhead shower complete with 115mm long bend pipe connecting to legs &amp; wall flanges (for Guest Bathroom)</td>
</tr>
<tr>
<td>18.1</td>
<td>Providing and fixing Wall Mixer (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>18.2</td>
<td>Providing and fixing Hand Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>18.3</td>
<td>Providing and fixing Exposed Shower Pipe for wall mixer (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>18.4</td>
<td>Providing and fixing Overhead Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>18.5</td>
<td>Providing and fixing Flexible Tube (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>18.6</td>
<td>Providing and fixing Wall Bracket for Hand Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>19</td>
<td>Providing and fixing in position wall mixer 3 in 1 system with provision for bath hand shower and overhead shower complete with 115mm long bend pipe connecting to legs &amp; wall flanges (for Child Bathroom)</td>
</tr>
<tr>
<td>19.1</td>
<td>Providing and fixing Wall Mixer (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>19.2</td>
<td>Providing and fixing Hand Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>19.3</td>
<td>Providing and fixing Exposed Shower Pipe for wall mixer (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>19.4</td>
<td>Providing and fixing Overhead Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>19.5</td>
<td>Providing and fixing Flexible Tube (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>19.6</td>
<td>Providing and fixing Wall Bracket for Hand Shower (Make Jaquar Fusion Series)</td>
</tr>
<tr>
<td>20</td>
<td>Providing and fixing 25 Litres Electric Storage Geyser heavy duty type for 100 psi pressure rating with 15mm dia CP heavy angle stop cock, CP connectors, NRV, brackets all complete. (for Master Toilets) (Make Racold)</td>
</tr>
<tr>
<td>21</td>
<td>Providing and fixing instant geyser (3 KW Rating) with angle stop cock, CP connector, PRV, NRV all complete. (for Guest and Childrens) (Make Racold)</td>
</tr>
</tbody>
</table>

**E External Drainage**

<p>| 1    | Providing, laying and jointing in position heavy quality NECO C.I. Centri pipes conforming to IS:3989-84 including all fittings like offsets, bends, cowls, single or double junction of different degrees, with or without access door etc. including caulk. S.C.I. soil, waste and vent single socketed pipe 1.80 metres long: 75 mm dia |
| 2    | Excavation in trenches for pipes and chambers Depth upto 1.5 Meter from existing ground level and required level in all soils other than soft and hard rock for the following depths from ground levels including providing proper and adequate shoring, strutting, dewatering, Backfilling the trenches with selected excavated earth in layers not exceeding 150mm thick, watering, consolidating, compacting and disposing off surplus materials within the site, all complete as per specifications and directions of the Engineer-in-charge. |
| 3    | Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints of below mentioned sizes etc. complete : |
| 3.1  | 100 mm diameter |
| 3.2  | 150 mm diameter |
| 3.3  | 200 mm diameter |
| 4    | Constructing brick masonry inspection chamber size 900 x 450 and depth upto 600mm including the 230mm thick brick masonry wall in C.M. 1:5, C.C. foundation bed in M-15,150mm thick size 1560 x 1110, Cement plaster inside and outside in C.M. 1:3, C.C. M15 in haunches and channels finished smooth in C.M. C.C. M15 cap on top 150 thick, Concrete manhole frame 75 wide fillet (vata) all round thick masonry and C.C. bed in and covers for heavy duty purpose 75 wide fillet (vata) all round thick masonry and C.C. bed in |
| 5    | Constructing brick masonry chamber size 900 x 600 and depth upto 1200mm including the 230mm thick brick masonry wall in C.M. 1:5, C.C. foundation bed in M-15, 150mm thick size 1560 x 1110, Cement plaster inside and outside in C.M. 1:3, C.C. M15 in haunches and channels finished smooth in C.M. C.C. M15 cap on top 150 thick, Concrete manhole frame and covers for heavy duty purpose, 75 wide fillet (vata) all round thick masonry and C.C. bed in |
| 6    | Providing and installing 150mm dia. Glazed stone ware sewer trap in 1:1 cement sand joint inside the chamber or manhole |
| 7    | Supplying and fixing stoneware glazed gully trap in 1:1 cement send joint and abstructing chamber of 300 x 300 brick masonry chamebr of 150mm thick brick masonry in 1:5 cement and mortar 20mm thick 1:3 cement plaster smooth inside and rough outside and rough outside 100mm |</p>
<table>
<thead>
<tr>
<th></th>
<th>Providing and laying 1:3:6 cement concrete for bedding, pipe supports and encasing the pipes, including necessary form work, compaction, curing, de-watering, etc. All complete as per specifications and directions of the Engineer-in-charge.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td><strong>Soil waste, Vent, Anti-syphonage and internal drainage pipes &amp; fittings (sh:19.0 drainage)</strong></td>
</tr>
<tr>
<td>1</td>
<td>Providing, laying and jointing in position heavy quality NECO C.I. Centri pipes conforming to IS:3989-84 including all fittings like offsets, bends, cowls, single or double junction of different degrees, with or without access door etc. including caulk</td>
</tr>
<tr>
<td>1.1</td>
<td>S.C.I. soil, waste and vent single socketed pipe 1.80 metres long: 75 mm dia</td>
</tr>
<tr>
<td>1.2</td>
<td>S.C.I. soil, waste and vent single socketed pipe 1.80 metres long: 100 mm dia</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes of below mentioned size, having thermal stability for hot &amp; cold water supply including all CPVC plain &amp; brass threaded fittings. This includes jointing of pipes &amp; fittings with one step CPVC solvent cement, trenching, refilling &amp; testing of joints complete as per direction of Engineer in Charge. (for Wash Basin &amp; Sink Drain)</td>
</tr>
<tr>
<td>2.1</td>
<td>40 mm nominal outer dia Pipes</td>
</tr>
<tr>
<td>3</td>
<td>Excavation in trenches for pipes and chambers Depth upto 1.5 Meter from existing ground level and required level in all soils other than soft and hard rock for the following depths from ground levels including providing proper and adequate shoring, strutting, dewatering, Backfilling the trenches with selected excavated earth in layers not exceeding 150mm thick, watering, consolidating, compacting and disposing off surplus materials within the site, all complete as per specifications and directions of the Engineer-in-charge.</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing C.P. Brass heavy quality gratings of below mentioned size (3mm thick/SS) for floor drains including making necessary recessment grouting with neat cement all complete to the satisfaction and direction of the Engineer-in-charge.</td>
</tr>
<tr>
<td>4.1</td>
<td>150mm round/square</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing cast iron Pan connectors with or without vent holes straight/bend including providing &amp; jointing with drip seal joints.</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing in position deep seal approved make C.I. Nahani Trap with drip seal joints all complete as per specification (for Kitchen)</td>
</tr>
<tr>
<td>7</td>
<td>Supply, installation, testing &amp; commissioning heavy approved UPVC SWR type Multi Floor Traps of Size 110 x 80mm with minimum 50mm seal including fixing the same with the ring fittings, solvent cement joints complete to the satisfaction and direction of the Engineer-in-charge. (for Toilets)</td>
</tr>
<tr>
<td>G</td>
<td><strong>Pumping System</strong></td>
</tr>
<tr>
<td></td>
<td>Supply, installation, testing and commissioning of Vertical In Line type centrifugal pumps having cast iron casing and cast iron diffusers, Bronze impeller Dynamically Balanced AISI 304 stainless steel shaft running in ball bearing on both ends and protected by Bronze shaft sleeves. Pumps shall be fitted with mechanical seals, 2900 RPM, 415 volts, 50 cycles Ac 3 phase Motor should be rated for +/- 10% voltage fluctuation of standard 415 volts including all revelent accessories for complete installation and providing probe level control with cabling and should be oil cooled.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>1.1</td>
<td>Overhead Tank Feed Pump</td>
</tr>
<tr>
<td></td>
<td>Pumps 200 LPM @ 75 Mt. head, 7.5 H.P. or higher to suit the head and flow requirement x 1 + 1</td>
</tr>
<tr>
<td>1.2</td>
<td>Flushing Pumps</td>
</tr>
<tr>
<td></td>
<td>Pumps 200 LPM @ 75 Mt. head, 7.5 H.P. or higher to suit the head and flow requirement x 1 + 1</td>
</tr>
<tr>
<td>2</td>
<td>CONTROL PANEL</td>
</tr>
<tr>
<td>2.1</td>
<td>MCC Motor control centres shall be of tailor-made design, wall/ floor-mounted type manufactured in factory/shop. Enclosure shall be fixed type (modular draw-out design), dust-tight and vermin-proof having IP54 degree of protection. Main bus for phase and neutral shall be of uniform size insulated electrolytic copper. Separate insulated copper earth bus within the board shall be provided with a link between neutral and earth bus.</td>
</tr>
<tr>
<td>2.2</td>
<td>Board shall be provided with tow distinct and separate earth terminals on opposite side to connect external earth conductor. All accessible live terminals/ portion of components shall be provided with shrouds.</td>
</tr>
<tr>
<td>2.3</td>
<td>Board shall be provided with tow distinct and separate earth terminals on opposite side to connect external earth conductor. All accessible live terminals/ portion of components shall be provided with shrouds.</td>
</tr>
<tr>
<td>2.4</td>
<td>Board shall be provided with 75mm high base channel, with holes drilled for grouting to foundation. Maximum height of panel, including the height of base channel shall be 2450mm. Minimum and maximum operating heights shall be 300mm and 1800mm respectively. Each feeder compartment shall have a separate hinged door with rolled edges with concealed hinges and thumb grip type screws without any sharp corners to doors. Suitable sized thick non-deteriorating, continuous, neoprene sponge rubber gasket shall be provided all round the perimeter of adjacent cubicles, between cubicles and baseframe. Cutouts on front door for mounting lamps, meters, control switches, handle, etc with inscription plate for component shall be provided. Undrilled gland plate of 3mm thick shall be provided on rear TOP of board cable termination chamber shall be at the rear of the board.</td>
</tr>
<tr>
<td>2.5</td>
<td>Incoming and outgoing connections from switching devices shall be brought to the cable chamber in a staggered manner for cable terminations. These connections shall be supported on DMC/ epoxy insulators such that external cables are not required to be connected directly to the terminals of switching devices. Detachable barriers of perforated metal sheet or minimum 4mm thick non-hygrosopic hylam sheet shall be provided to prevent accidental contact with any live parts.</td>
</tr>
<tr>
<td>2.6</td>
<td>Board shall be spray painted after rust removal, cleaning, rinsing, pickling in acid and phosphatising treatment on sheet steel with two coats of zinc-rich primer and two coats of epoxy paint of approved shade.</td>
</tr>
<tr>
<td>2.7</td>
<td>Non rusting metallic or PVC engraved label with proper designation shall be fixed on the front cover of each compartment, in addition to the name-plate for entire MCC. The weight and overall dimensions (LxDxH) MUST be furnished along with the offer with the details of shipping sections, if any. Scope of these TWO MCCS shall comply with all above requirements.</td>
</tr>
<tr>
<td>2.8</td>
<td>The Contractor shall provide additional spare Contact in his Panel/Starter for Alarm indicating &amp; connection for Building Automation System.</td>
</tr>
<tr>
<td>2.9</td>
<td>The Contact shall be Voltage free as required.</td>
</tr>
<tr>
<td>2.10</td>
<td>Tenderer shall provide any all suitable cables as required for respective panels to pump for complete working of the System at no additional cost. Cables shall be copper conductor minimum size 3Cx2.5 sq.mm PVCA 1.1 KV grade</td>
</tr>
<tr>
<td>2.11</td>
<td>Fabricating, Supplying and installing in position sheet steel wall/clad floor mounting pattern front opening type control panel.</td>
</tr>
<tr>
<td>2.12</td>
<td>All the pumps can be selected for off/ manual position through its manual position its individual selector switches. In manual position the pump shall run continuously till switched off. In automatic position the pump shall start and stop on the level controllers.</td>
</tr>
<tr>
<td>2.13</td>
<td>Probe level controllers shall be provided including necessary cabling from tanks to pumps wherever necessary.</td>
</tr>
<tr>
<td>2.14</td>
<td>Vendor shall submit shop drawings for electrical panel and wiring diagram for approval.</td>
</tr>
<tr>
<td>2.15</td>
<td>Panel shall be fabricated as per the Drawings furnished by the Consultants and from their approved Vendor</td>
</tr>
<tr>
<td>2.16</td>
<td>CONTROL PANEL FOR OVER HEAD FEED PUMPS</td>
</tr>
<tr>
<td>Domestic Pumps 1 + 1 x (7.5 H.P or higher to suit the head and flow requirement each)</td>
<td></td>
</tr>
<tr>
<td>Flushing Pumps 1 + 1 x (7.5 H.P. or higher to suit the head and flow requirement each)</td>
<td></td>
</tr>
</tbody>
</table>
# SPECIFICATIONS

## ELECTRICAL

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>Per Phase Isolation (PPI) MCB Distribution Board's for Flats:</strong></td>
</tr>
</tbody>
</table>
| 1       | Providing, installing, commissioning & testing, MCB distribution boards IP-42 protection with MCB, RCCB, inter connections, earthing, DB chart etc. complete as per specification and as per drawing and standard make as specified.  
   Note:  
   i. All the MCB’s shall be "C" Curve Characteristic.  
   ii. Laminated A3 or A4 size SLD & control drawings copy shall be pasted inside the DB door. |
| **B**  | **Sub Main Wiring for Flats:** |
| 1       | Providing and laying Sub main wiring using copper conductor PVC insulated wires in 32mm dia (For Normal supply) / 25mm dia. (For Emergency supply) heavy duty PVC conduit partly open in electrical duct & partly concealed in slab from MCB in Metering Cubical Panel to MCB DB at respective floor level |
| 1.1     | 4 Nos. x 16 sqmm + 2 No. x 2.5 sqmm cu. Wires (For 3BHK Flats - Normal power Supply) |
| 1.2     | 2 Nos. x 2.5 sqmm + 1 No. x 2.5 sqmm cu. Wires (For 3BHK Flats - Emergency power Supply) |
| 2       | Suppling & fixing following rigid PVC FRLS Heavy Duty conduits thickness not less than 2mm with conduits accessories (coupling, junction boxes, clamps) & GI Fish wire for following areas. |
| 2.1     | 32mm dia. (From 3BHK Flats - Normal power Supply - MCB in Metering Cubical Panel to MCB_DB in flat) |
| 2.2     | 25mm dia. (From 3BHK Flats - Emergency power Supply - MCB in DG Power DB-1 & 2 to MCB_DB in flat) |
| **C**   | **FLAT LIGHTING AND POWER POINT WIRING** |
Note:
(i) All point wiring, circuiting and sub main wiring shall be done using rigid Medium duty PVC conduit & shall comply with latest S.S. & F 1A approval.

(ii) All wiring will be concealed and will include pulling of wiring through specified standard PVC conduits laid in walls/ceiling/slabs or wherever necessary, including chipping of the surface and making good the same after laying of conduits.

(iii) All switch board under the point wiring shall include modular poly carbonate cover plates, modular switched sockets, regulators (wherever necessary), single pole rocker operated flush mounted switch and standard boxes available and the same shall be suitable for concealed work. The boxes should be as per the manufactures standard & should be suitable to accommodate number of control switches, sockets, wiring etc as per indicated in drawing.

(iv) The entire wiring shall have continuous 1.5 Sq.mm / 2.5 sqmm FRLS copper conductor earth wire having green colour in 660 / 1100 Volts grade.

(v) The point wiring shall comply to IS : 732.

(vi) The point wiring shall include wiring of lights, sockets outlets of any length from distribution board / switch board via switch or MCB to the point and including providing circuit wiring in 25mm dia. PVC conduit Medium duty of 2mm wall thickness and using 1.5 Sq.mm / 2.5 Sq.mm / 4 Sq.mm FRLS copper conductor wires for circuit wiring (Phase and neutral) of 660 / 1100 Volt grade and 1.5 Sq.mm / 2.5 Sq.mm green colour copper wire for earthing in 660 / 1100 Volt grade.

(vii) Consider 5 mtr. average length of point wiring

(viii) Consider 8 to 10 mtr. average length of power plug points

(ix) Switchboard to switchboard looping average length 5 to 8 mtr.

1 NORMAL CONDITION- POINT WIRING FOR FLATS:

1.1 Wiring for the following light points with 2.5 sq.mm PVC insulated copper conductor of 1100 volts grade, stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC Conduit, and earthing of fixtures and the outlet box with 1.5 sq.mm PVC insulated copper conductor stranded flexible "Fire Retardant Low smoke (FRLS)" wire with terminations, as per detailed drawing and specifications:

(i) MCB controlled Primary point (from DB to control switch board)

(ii) Primary point without switch (from switch board to switch board looping)

1.2 Wiring for the following light points with 1.5 sq.mm PVC insulated copper conductor of 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embedded PVC Conduit, including providing and fixing of switchboards as shown in drawing with 6 amps single pole rocker operated flush mounted switch of approved quality colour make & design mounted on 1.6 mm thick GI back box and earthing of fixtures and the outlet box with 1.5 sq.mm PVC insulated copper conductor stranded flexible "Fire Retardant Low smoke (FRLS) wires" wire with terminations, as per detailed drawing and specifications:

(i) Secondary point with switch (from switch board to first light point)

(ii) Secondary point without switch (from light point to light point)
| 1.3 | Wiring for 250 volts single phase and neutral 16 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with **2 Nos. 4 sq.mm + 1No. 2.5 Sq mm** PVC insulated copper conductor stranded flexible 1100 volts grade flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embeded PVC conduit from DB to point including providing and fixing of switchboard as shown in drawing having 16 amps 5 pin switched sockets of approved make and design in 1.6 mm thick GI back box with grid plates and earthing the third pin of each socket outlet, as per detailed drawing and specifications. *(For Microwave Oven & Dish washer)* |
| 1.4 | Wiring for 250 volts single phase and neutral 16 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with **2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm** PVC insulated copper conductor stranded flexible 1100 volts grade flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embeded PVC conduit from DB to point including providing and fixing of switchboards of 16 amps 5 pin switched sockets of approved make and design in 1.6 mm thick GI back box with grid plates and earthing the third pin of each socket outlet, as per detailed drawing and specifications. *(For Mixer & Washing machine)* |
| 1.5 | Wiring for 250 volts single phase and neutral 6 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with **2.5sq.mm PVC insulated copper conductor** of 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embeded PVC conduit from DB to point & looped to lighting circuit including providing and fixing of 6 amps 3 pin switch socket outlet of approved make and design in 1.6 mm thick GI back box with grid plate and earthing of third pin of the socket with **1.5 Sq. mm PVC insulated copper conductor** stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications (6 amp switch socket outlet from DB) |
| 1.6 | Wiring for 250 volts single phase and neutral 6 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with **1.5 sq.mm PVC insulated copper conductor** 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embeded PVC conduit **Looped to item no. 1.5 above**, including providing and fixing of 6 amps 3 pin switch socket outlet of approved make and design in 1.6 mm thick GI back box with grid plate and earthing of third pin of the socket with **1.5 Sq. mm PVC insulated copper conductor** stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications (6 amp switch socket outlet looped with 6 amp switch socket outlet). |
| 1.7 | Wiring for **Ceiling Fan** point including Terminations with **1.5 sq.mm PVC insulated copper conductor** 1100 volts grade stranded flexible "Fire Retardant Low smoke (FRLS)" wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embeded PVC conduits & looped to lighting circuit including providing fan hook box, 6 amps switch and 120 watts electronic fan regulator of approved make in GI box and earthing the fan and outlet box with **1.5 sq. mm. PVC insulated copper conductor** stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications. |
| 1.8 | Wiring for **Exhaust fan** point including Terminations with **1.5 sq. mm. Insulated copper conductor** 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embedded PVC Conduit & looped to lighting circuit including providing and fixing of Ceiling Rose near the exhaust fan, as per detailed drawing and specifications. |
| 1.9 | Wiring for **Split AC Point** including Terminations with **2 Nos. 4 sq.mm + 1No. 2.5 Sq mm** PVC insulated copper conductor stranded flexible 1100 volts grade flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embedded PVC conduit from DB to point including providing and fixing of 20 amps 3 pin Ray Roll Industrial socket outlet in concealed box near to Split AC and 16 amps SP MCB of approved make and design for AC control in the main switch board as shown in drawing, in 1.6 mm thick GI back box with lockable acrylic door and earthing through the third pin of the socket outlet and GI box with 2.5 sq. mm. PVC insulated copper conductor flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications. |
| 1.10 | Wiring for **Geyser point** including Terminations with **2 Nos. 4 sq.mm + 1No. 2.5 Sq mm** PVC Insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC Conduit including providing and fixing of 20 amps 3 pin Ray Roll Industrial socket outlet and 16 amps SP MCB of approved make in concealed Box located near to geyser inside bathroom to control geyser and earthing through the third pin of the socket outlet and 1.6 mm GI back box with 2.5 sq. mm. PVC insulated copper conductor flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications. (For Instant Geyser in Guest Bedroom -1 & Childen Bedroom - 2) |
| 1.11 | Wiring for **Geyser point** including Terminations with **2 Nos. 4 sq.mm + 1No. 2.5 Sq mm** PVC Insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embedded PVC Conduit including providing and fixing of 20 amps 3 pin Ray Roll Industrial socket outlet located near to geyser & 16 Amps SP MCB at the toilet entrance switch board to control geyser and earthing through the third pin of the socket outlet and GI back box with 2.5 sq. mm. PVC insulated copper conductor flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications. (For Storage Geyser in Master Bedroom -2) |
| 1.12 | Wiring for **BELL points** including Terminations with **1.5 sq. mm. PVC insulated copper conductor** 1100 volts grade stranded flexible FRLS Wires including 20mm dia. 2mm thick embedded PVC conduit & looped to lighting circuit including fixing of electronic call bell (as per interior designer) and earthing of GI box with **1.5 sq mm PVC insulated copper conductor** stranded flexible FRLS Wire, as per detailed drawing and specifications. |
| 1.13 | Wiring for **Window AC point** including Terminations with **2 Nos. 4 sq.mm + 1No. 2.5 Sq mm** PVC Insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embedded PVC conduit including 1.6 mm thick GI back box with grid plates and earthing the third pin of each socket outlet and providing and covering the back box with blank plate suitable for 20 amps 3 pin Ray Roll Industrial socket outlet and 16 amps SP MCB of approved make as per detailed drawing and specifications. **Note :- Power supply to the socket looped from Split AC Socket.** |
| 1.14 | Provision for Supply of following point wiring including switchboard back boxes, Front blank plate & Point wiring for the lighting & power points without Wiring accessories, as per detailed drawing and specifications: (i) **SB-3 (P)** - 1 No. 5 Amp switch socket with 2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm Copper conductor wiring (Looping from Switch Board SB-3) (ii) **SB-4 (P)** - 2 Nos. 5 Amp switch socket with 2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm Copper conductor wiring (Looping from Switch Board SB-4) (iii) **SB-26 (P)** - 1 No. 5 Amp switch socket with 2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm Copper conductor wiring & 1 No. Light Point with 3 Nos. 1.5 sq.mm Copper conductor wiring (Looping from Switch Board SB-26) (iv) **SB-27 (P)** - 2 Nos. 5 Amp switch socket with 2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm Copper conductor wiring (Looping from Switch Board SB-27) |
| 2 | **EMERGENCY CONDITION- POINT WIRING FOR FLATS** |
| 2.1 | Wiring for the following light points with **2.5 sq.mm PVC insulated copper conductor** 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC Conduit, and earthing of fixtures and the outlet box with **1.5 sq.mm PVC insulated copper conductor** stranded flexible "Fire Retardant Low smoke (FRLS) wires" wire with terminations, as per detailed drawing and specifications: (i) MCB controlled Primary point (from DB to control switch board - cost of switch & board NOT included) (ii) Primary point without switch (from switch board to switch board looping) |
| 2.2 | Wiring for the following light points with **1.5 sq.mm PVC insulated copper conductor** 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC Conduit, including providing and fixing of switchboards with 6 amps single pole rocker operated flush mounted switch as shown in drawing, of approved quality colour make & design mounted on 1.6 mm thick GI back box and earthing of fixtures and the outlet box with **1.5 sq.mm PVC insulated copper conductor** stranded flexible "Fire Retardant Low smoke (FRLS) wires" wire with terminations, as per detailed drawing and specifications: (i) Secondary point with switch (from switch board to first light point) (ii) Secondary point without switch (from light point to light point) |
2.3 Wiring for 250 volts single phase and neutral 16 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with 2 Nos. 2.5 sq.mm + 1No. 1.5 Sq mm PVC insulated copper conductor stranded flexible 1100 volts grade flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embedded PVC conduit from DB to point including providing and fixing of 16 amps 5 pin switched sockets of approved make and design in 1.6 mm thick GI back box with grid plates and earthing the third pin of each socket outlet, as per detailed drawing and specifications. (For Fridge)

2.4 Wiring for 250 volts single phase and neutral 6 amps white modular poly carbonate cover plate, modular switched socket outlet including Terminations with 2.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC conduit from DB to point & looped to lighting circuit including providing and fixing of 6 amps 3 pin switch socket outlet of approved make and design in 1.6 mm thick GI back box with grid plate and earthing of third pin of the socket with 1.5 Sq.mm PVC insulated copper conductor stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications.

2.5 Wiring for Ceiling Fan point including Terminations with 1.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible "Fire Retardant Low smoke (FRLS)" wires (for Ph. & N) of approved make including 25mm dia. 2mm thick embedded PVC conduits & looped to lighting circuit including providing fan hook box, 6 amps switch and 120 watts electronic fan regulator of approved make in GI box and earthing the fan and outlet box with 1.5 sq.mm PVC insulated copper conductor stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specifications.

3 Providing following sizes Ceiling Mounted PVC Junction boxes with Acrylic cover of reputed make for pulling the wires upto the DB as shown in the layout plan: (i) 300 mm x 300 mm x 75 mm (For LT system) (ii) 150 mm x 150 mm x 75 mm (For LV system)

4 Providing and fixing following rigid PVC conduits & conduits accessories with thickness not less than 2mm, as per detailed drawing and specifications: (i) 20mm dia. (ii) 25mm dia. (From Junction Box to LV Box - LV system) (iii) 32mm dia. (From Junction Box to MCB DB - LT system)

D TELEPHONE NETWORK INSIDE FLAT

1 Providing and fixing 300 mm x 300 mm LV Box with MS powder coated enclosure flush / wall mounted suitable for 1 no. 10 pair TTB & 1 no. 6 way splitter Box inside the flat

2 Providing and fixing 10 pair TTB in each flat

3 Providing and making wiring using 5 Pair 0.51 sqmm Tin Copper telephone cable in 20mm dia PVC pipe conduit for telephone outlet socket in flats from flat TTB to respective flush mounted modular type, telephone jack type outlet socket (RJ -11) point, as per detailed drawing and specifications (Average 10 Mtr. / Telephone Point)

4 Providing and fixing flush mounted modular type telephone jack type outlet socket (RJ -11) of approved make fixed manufactures standard G.I. Boxes flush with wall / wooden panel all complete as per direction

5 Providing and fixing flush mounted modular type Data outlet socket (RJ -45) of approved make fixed manufactures standard G.I. Boxes flush with wall / wooden panel all complete as per direction
<table>
<thead>
<tr>
<th></th>
<th>Supplying &amp; fixing following rigid PVC FRLS Heavy Duty conduits thickness not less than 2mm with conduits accessories (clamps, coupling, junction boxes) &amp; GI Fish wire for pulling of wires in Slab, as per detailed drawing and specifications: (i) 20mm dia. (From Telephone points to LV Box - Average 10 Mtr. / Telephone Point) (ii) 25mm dia. (iii) 32mm dia.</th>
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<tbody>
<tr>
<td>E</td>
<td>T.V. SYSTEM FOR FLAT</td>
</tr>
<tr>
<td>1</td>
<td>Providing &amp; laying following side T.V. co-axial cables in 20 mm dia. rigid PVC conduit from main splitter box to respective floor splitter boxes with necessary pull boxes as required: (i) R.G. - 6 (U) Co-axial cables (Average 10 Mtr. / TV Point)</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing following splitter boxes on all floors as shown in Layout Drawings (i) 6 Way Splitter Boxes (ii) 4 Way Splitter Boxes</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing flush mounted modular type T.V. Antenna outlet socket of approved make fixed in manufactures standard G.I. Boxes flush with wall complete with all accessories.</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing following rigid PVC conduits &amp; conduits accessories thickness not less than 2mm: (i) 20mm dia. (From TV points to LV Box - Average 10 Mtr. / TV Point) (ii) 25mm dia. (iii) 32mm dia.</td>
</tr>
<tr>
<td>F</td>
<td>LIGHTING FIXTURES &amp; APPLIANCES ( IN THE FLAT )</td>
</tr>
<tr>
<td>1</td>
<td>Supply, Unloading, Handling, Installation, testing &amp; commissioning of following surface / recessed type lighting fixtures complete with lamps, control gear &amp; electronic ballasts, all fixing accessories such as downrope etc. as directed:</td>
</tr>
<tr>
<td>1.1</td>
<td>Wall Mounted 22 W 4 Feet LED Tubelight</td>
</tr>
<tr>
<td>1.2</td>
<td>Wall Mounted 12 W LED Bracket Light for rooms</td>
</tr>
<tr>
<td>1.3</td>
<td>Wall Mounted 7 W LED Bracket Light for bathrooms</td>
</tr>
<tr>
<td>1.4</td>
<td>Ceiling Mounted 12 W LED Light for flat</td>
</tr>
<tr>
<td>1.5</td>
<td>Exhaust fans BEE FIVE star certified 300mm sweep</td>
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<tr>
<td>1.6</td>
<td>Ceiling fans BEE FIVE star certified 1200mm sweep with double ball bearing, three blades, white colour complete with speed Regulator (For Living, Dinning &amp; Bedroom)</td>
</tr>
<tr>
<td>1.7</td>
<td>Ceiling fans BEE FIVE star certified 900mm sweep with double ball bearing, three blades, white colour complete with speed Regulator (For Kitchen)</td>
</tr>
<tr>
<td>1.8</td>
<td>Ceiling fans BEE FIVE star certified 600mm sweep with double ball bearing, three blades, white colour complete with speed Regulator (For Store)</td>
</tr>
<tr>
<td>1.9</td>
<td>Chime type bell Buzzer</td>
</tr>
<tr>
<td>1.10</td>
<td>1 Liter Instant type Wall mounted Water Geyser BEE FIVE star certified (For Bedroom -1 &amp; 3)</td>
</tr>
<tr>
<td>1.11</td>
<td>25 Liter Capacity Storage type Wall mounted Water Geyser BEE FIVE star certified (For Master Bedroom-2)</td>
</tr>
<tr>
<td>PART 2</td>
<td>COMMON AREA</td>
</tr>
<tr>
<td>A</td>
<td>METER BOARD (LOCATION - ELECTRICAL METER ROOM)</td>
</tr>
<tr>
<td>1</td>
<td>Design, fabrication, providing, erection connection, testing &amp; commissioning of cubical type Metering panel with separate hinged door, viewing glass &amp; sealable / locking arrangement. Meter cubical board shall be fabricated out of 2mm/1.6mm CRCA sheet steel and provided with powder coating, Siemens Grey shade No. RAL 7032, as per detailed drawing and specifications.</td>
</tr>
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</table>
FLOOR MOUNTED METERING CUBICAL PANEL (LOCATION - ELECTRICAL ROOM) consisting of -

(i) **INCOMER** comprising of -
   (a) 1 No. - 400 Amp. MCCB’s TPN (35KA) TM+ROH OL/SC - 0 - 500 V - Voltmeter with Selector switch
   (b) 1 Set - 0 - 400A - Ammeter with Selector switch & CT’s 400 / 5 Amp
   (c) 1 Set - Extended Rotary Operating Mechanism
   (d) 1 Set - LED 3 Phase indicating lights.
   (ii) **BUSBARS** - 500 Amps TPN (50 KA for 1 sec) Copper bus bars with colour coded heat shrinkable insulating sleeves – 1 Set
   (iii) **OUTGOING** comprising of metering compartments having the following-
   (a) 37 Nos. - 63 Amp TPN MCB’s (10 KA)
   (b) 37 Nos. - Direct Operated 10-60A 3Phase 4 Wire KWH Electronic Meter (Tariff Meter) duly tested from Reputed laboratory (Make - HPL / SOCOMEC)
   (c) 3 Nos. - 40 Amp TPN MCB’s (10 KA)
   (d) 3 Nos. - Direct Operated 10-40A 3Phase 4 Wire KWH Electronic Meter (Tariff Meter) duly tested from Reputed laboratory (Make - HPL / SOCOMEC)

**LT PANELS**

NOTE -
(i) MCCB’s (LSIG) shall be thermal magnetic. (ii) All MCCB’s shall with additional Earth fault relay (LSIG). (iii) LT panels shall be 'FORM-4,TYPE-3b', suitable for indoor installation, use on 415 Volts 3-phase, 4wire, 50Hz. (iv) Density of aluminium busbars shall be 0.78 A/sq mm & Copper shall be 1.2 A/Sqmm. (v) All the switchgear shall have short circuit rating as per BOQ. (vi) The Earthing for all components, frame etc. to a common internal earthing bar. (vii) MS base frame for Standalone panels. (viii) All the switchgear breaking capacities shall be ICU = ICS.

Design, fabrication, providing, erection connection, testing & commissioning of following cubical indoor, floor mounting type, sheet steel, clad dust, and vermin proof, I.P. - 53 protection L.T. Panel Boards, suitable for 440 Volts, 3 Phase, 4 Wire, 50 Hz, supply System. Complete with cable allays, bus bars, solid inter connection between bus bars to switch gears, TOP/BOTTOM cable entries as required, powder coated finish of approved shade etc. all as specified and as per detailed drawing and specifications.

POWER PANEL FOR COMMON AREA LIGHTING (LOCATION - ELECTRICAL ROOM) consisting of -

(i) **INCOMER** comprising of -
   (a) 1 No. - 63 Amp. 4 Pole Auto Transfer Switch (ATS) ASCO 230 series (10KA)
   (ii) 1 No. - 63 Amp. MCB’s TPN with Selector switch with 4A MCB
   (iii) 1 Set - 0 - 500 V - Voltmeter with Selector switch & CT’s 63/5 Amp.
   (iv) 1 Set - 0 -63A - Phase indicating lamps
   (v) 1 Set - LED 3
   (b) **BUSBAR** - 100 Amp TPN Copper (25KA) comprising of -
   (c) **OUTGOING** - 6 Nos. - 40
| CHANGEOVER POWER PANEL FOR FIRE HYDRANT & UTILITY LOAD (LOCATION - PUMP ROOM) consisting of - | (a) **INCOMER**  
(i) 1 No. - 400 Amp. 4 Pole Auto Transfer Switch (ATS) ASCO 230 series  
(ii) 1 No. - 400 Amp TPN ISOLATOR  
(iii) 1 Set - 0 - 500 V - Voltmeter with Selector switch with 4A MCB  
(iv) 1 Set - 0 - 400A - Ammeter with Selector switch & CT's 400/ 5 Amp.  
(v) 1 Set - LED 3 Phase indicating lamps  
(b) **BUSBAR** - 500 Amps TPN Copper (50KA)  
(c) **OUTGOING** comprising of -  
(i) 1 No. - 400 Amp TPN ISOLATOR  
(ii) 1 No. - 63 Amp. TPN SFU |
| --- | --- |
| UTILITY POWER PANEL (LOCATION - PUMP ROOM) consisting of -  
(a) **INCOMER** comprising of -  
(i) 1 No. - 63 Amp. MCB's TPN (10KA)  
(ii) 1 Set - 0 - 500 V - Voltmeter  
(iii) 1 Set - 0 - 63A - Ammeter with Selector switch & CT's 63/ 5 Amp.  
(iv) 1 Set - LED 3 Phase indicating lamps  
(b) **BUSBAR** - 100 Amps TPN Copper (25KA)  
(c) **OUTGOING** comprising of -  
(i) 5 Nos. - 40 Amp TPN ISOLATOR |
| POWER PANEL FOR FIRE HYDRANT SYSTEM (LOCATION - PUMP ROOM) consisting of -  
(a) **INCOMER** comprising of -  
(i) 1 No. - 400 Amp TPN ISOLATOR  
(ii) 1 Set - 0 - 500 V - Voltmeter  
(iii) 1 Set - 0 - 400 A - Ammeter with Selector switch & CT's 400 / 5 Amp.  
(iv) 1 Set - LED 3 Phase indicating lamps  
(b) **BUSBAR** - 500 Amps TPN Copper (50KA)  
(c) **OUTGOING** comprising of -  
(i) 2 Nos. - 200 Amp TPN ISOLATOR , 50-90 Amp Over load Relay, 105 Amp TP contactor , Star Delta Timer , On delay timer, 0 - 200 A - Ammeter with Selector switch & CT's 105 / 5 Amp. ( Star Delta starter for Hydrant and sprinkler main pump)  
(ii) 1 No. - 50 Amp TPN ISOLATOR , 10-16 Amp Over load Relay, 16 Amp TP contactor , Star Delta Timer , On delay timer, 0 - 100 A - Ammeter with Selector switch & CT's 16 / 5 Amp. ( Star Delta starter for jockey pump)  
(iii) 2 Nos. - 25 Amp TPN ISOLATOR , 6-12 Amp Over load Relay, 12 Amp TP contactor , 0 - 100 A - Ammeter with Selector switch & CT's 12 / 5 Amp. ( DOL starter for booster pump) |
| POWDER COATED ENCLOSURE for Strectcher Lift (Location - Meter Room) consisting of -  
40 Amp. 4 Pole Auto Transfer Switch (ATS) ASCO 230 series |
### DG POWER PANEL (LOCATION - PUMP ROOM) consisting of -

- **INCOMER** comprising of -
  - (i) 1 No. - 630 Amp. MCCB’s TPN (35KA)
  - (ii) 1 Set - 0 - 500 V - Voltmeter
  - (iii) 1 Set - 0 - 630A - Ammeter with Selector switch & CT's 630/ 5 Amp.
  - (iv) 1 Set - LED 3 Phase indicating lamps

- **BUSBAR** -
  - 800 Amps TPN AL (50KA)

- **OUTGOING** comprising of -
  - (i) 1 No. - 400 Amp TPN ISOLATOR
  - (ii) 4 Nos. - 63 Amp TPN MCB’s (10 KA)
  - (iii) 1 No. - 40 Amp TPN MCB’s (10 KA)

### POWER PANEL FOR COMMON AREA TIMER CONTROL (FOR AUTOMATIC ON & OFF) LIGHTING & POWER consisting of -

- **INCOMER** comprising of -
  - (i) 1 No. 40 Amp. TPN MCB 10kA
  - (ii) 40 amps 3 pole contactor 415V, 50 hz - 1 No.
  - (iii) "ON" /"OFF" push buttons and indicating lamps. - 2 Nos.
  - (iv) Legrand / Schneider / Siemens make 24 x 7 Timer & Contactor for lighting control
  - (v) Auto Manual Switch - 1 No.

- **PHASE CONTROL** comprising of -
  - (i) 3 No’s 40 A DP RCCB, 100 mA sensitivity

- **OUTGOING** comprising of -
  - (i) 18 Nos. 10 Amp. SP MCB (10 KA)

### PER PHASE ISOLATION (PPI) MCB DISTRIBUTION BOARD’S

- Providing, installing, commissioning & testing, MCB distribution boards IP-42 protection with MCB, RCCB, inter connections, earthing, DB chart etc. complete as per specifications & make as specified.

- **NOTE** -
  - (i) All the MCB’s shall be "C" Curve Characteristic.
  - (ii) Laminated A3 or A4 size SLD & control drawings copy shall be pasted inside the DB door.

### COMMON AREA (LOBBY, MR., LAUNDRY, STORE & TOI., LIFT CAGE & SHAFT LIGHT) (LOCATION - GROUND FLOOR PARKING AREA) - 4 Way TPN MCB DB comprising of -

- **INCOMER** comprising of -
  - (i) 1 No. 40 Amp. TPN MCB 10kA

- **PHASE CONTROL** -
  - (i) 3Nos. - 40A DP RCCB 100mA sensitivity

- **OUTGOING** comprising of -
  - (i) 12 Nos. 10 Amp. SP MCB (10 KA)
## TERRACE FUNCTION LIGHTING & POWER DB (LOCATION - TERRACE) - 4 Way TPN MCB DB comprising of -

<p>| | | |</p>
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</table>
| 1.2 | **TPN MCB DB** | comprising of -
|   |   | (a) **INCOMER** comprising of -
|   |   | (i) 1 No. 40 Amp. TPN MCB 10kA
|   |   | (b) **PHASE CONTROL** -
|   |   | (i) 3Nos. - 40A DP RCCB 100mA sensitivity
|   |   | (c) **OUTGOING** comprising -
|   |   | (i) 6 Nos. 10 / 20 Amp.
|   |   | (ii) 6 Nos. Blank Plates

|   |   | 100mA sensitivity of -
|   |   | SP MCB (10 KA)

## DG POWER DB - 1 & 2 (2 no's) FOR FLAT INTERNAL POWER SUPPLY (LOCATION - ELECTRICAL ROOM) -

|   |   | 8 Way TPN MCB DB - 2 No's, comprising of -

|   |   | (a) **INCOMER** comprising of -
|   |   | (i) 1 No. 63 Amp. TPN MCB 10kA

|   |   | (b) **OUTGOING** comprising of -
|   |   | (i) 24 Nos. 10 Amp. SP MCB (10 KA)

## LT CABLES

|   |   | NOTE : LT cable items will include the following -
|   |   | (i) Effective proper and adequate connection at terminations
|   |   | (ii) Providing and fixing all accessories such as clamps, nuts, bolts & screws and cable tags at appropriate distances.
|   |   | (iii) Jointing by crimping type lugs
|   |   | (iv) Cutting, chases holes & making good the same wherever required

|   |   | Providing, laying / fixing, testing & commissioning of following size of 1.1 KV grade PVC insulated Aluminium/Copper conductor armoured cables laid in ready trench, laid on cable trays, fixing on walls in an approved manner or required complete with earthing alongwith cable (earthing will be separate item) all complete as required as per final direction and approval -
|   |   | (i) 3.5C X 300sqmm AYFY
|   |   | (ii) 3.5C X 240sqmm AYFY
|   |   | (iii) 3.5C X 185sqmm AYFY
|   |   | (iv) 3.5C X 150sqmm AYFY

|   |   | (v) 4 C x 16 Sq.mm YFY
|   |   | (vi) 4C x 10 Sq.mm YFY
|   |   | (vii) 4 C x 6 Sq.mm YFY
|   |   | (viii) 4 C x 4 Sq.mm YFY
|   |   | (ix) 4 C x 2.5 Sq.mm YFY
|   |   | (x) 4 C x 25 Sq.mm YFY
|   |   | (xi) 4 C x 2.5 Sq.mm YFY with 1 Core used for earthing
|   |   | (For Street light poles)
|   |   | (xii) 3 C x 4 Sq.mm YFY
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Providing earth pit with 75mm dia. G.I. perforated pipe, 3 mtr length as earth conductor, watering G.I. perforated pipe in funnel masonry chamber, complete as per drawing and conforming to IS 3043 as per detailed drawing and specification, including all excavation and backfilling up to depth of 3.0 meter and bringing the surface to the original finish.</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing of 25 X 6 mm G.I. earth strip looping on paraphet wall at terrace level and the conductor running down along the 4 corners of the building clamping to the external wall up to the specific test link blocks as per detailed drawing and specification.</td>
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<tr>
<td></td>
<td><strong>3</strong> Providing and fixing 32 X 6 mm GI earth strip from the test link boxes to the earthing pits, partly open &amp; partly underground, as per detailed drawing and specification.</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td></td>
<td><strong>4</strong> Providing of lightening arrestor with 25mm dia. 1 meter long copper rod having 200 x 200 x 6 mm brass plate as a base plate and arrestor with copper rod having 75mm dia. globe with 5 Nos. 6mm dia., 100mm long spokes duly fixed on surface with anchor fasteners as per detailed drawing and specification.</td>
</tr>
<tr>
<td></td>
<td><strong>5</strong> Providing and fixing of earth terminal test joint boxes fabricated and out 14 gauge CRCA sheet galvanized with 250mm long 40 x 6mm G.I. Earth terminal plate with long brass nut bolts duly fixed in a box and clamped to the external wall as per detailed drawing and specification.</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td><strong>COMMON AREA LIGHTING AND POWER POINT WIRING</strong></td>
</tr>
</tbody>
</table>
|   | **Note:**
|   | (i) All points wiring, circuiting and sub main wiring shall be done using rigid Medium duty PVC conduit & shall comply with latest S.S. & F 1A approval.  
|   | (ii) All wiring will be concealed and will include pulling of wiring through specified standard PVC conduits laid in walls / ceiling / slabs or wherever necessary, including chipping of the surface and making good the same after laying of conduits.  
|   | (iii) All switch board under the point wiring shall include modular poly carbonate cover plates, modular switched sockets, regulators (wherever necessary), single pole rocker operated flush mounted switch and standard boxes available and the same shall be suitable for concealed work. The boxes should be as per the manufactures standard & should be suitable to accommodate number of control switches, sockets, wiring etc as per indicated in drawing.  
|   | (iv) The entire wiring shall be have continuous 1.5 Sq.mm / 2.5 sqmm FRLS copper conductor earth wire having green colour in 660 / 1100 Volts grade.  
|   | (v) The point wiring shall comply to IS : 732.  
|   | (vi) The point wiring shall include wiring of lights, sockets outlets of any length from distribution board / switch board via switch or MCB to the point and including providing circuit wiring in 25mm dia. PVC conduit Medium duty of 2mm wall thickness and using 1.5 Sq.mm / 2.5 Sq.mm / 4 Sq.mm FRLS copper conductor wires for circuit wiring (Phase and neutral) of 660 / 1100 Volt grade and 1.5 Sq.mm / 2.5 Sq.mm green colour copper wire for earthing in 660 / 1100 Volt grade.  
|   | (vii) Consider 5 mtr. average length of point wiring  
|   | (viii) consider 8 to 10 mtr. average length of power plug points  
|   | (ix) switchboard to switchboard looping average length 5 to 8 mtr |
| **1.1** | **POINT WIRING FOR COMMON AREA** |
|   | Wiring for the following light points with 2.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm/ 25mm dia. 2mm thick embedded PVC Conduit, and earthing of fixtures and the outlet box with 1.5 sq.mm PVC insulated copper conductor stranded flexible "Fire Retardant Low smoke (FRLS) wires" wire with terminations, as per detailed drawing and specification -  
|   | (i) MCB controlled Primary point (from MCB to first light point)  
|   | (ii) MCB controlled Secondary point with 1.5 sqmm looping (from point to point of same circuit)  
|   | (iii) MCB controlled Primary point (from DB to control switch board)  
|   | (iv) Primary point without switch (from switch board to switch board looping) |
Wiring for the following light points with 1.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm/25mm dia. 2mm thick embedded PVC Conduit, providing and fixing of 6 amps single pole rocker operated flush mounted switch of approved quality colour make & design mounted on 1.6 mm thick GI back box and earthing of fixtures and the outlet box with 1.5 sq.mm PVC insulated copper conductor stranded flexible "Fire Retardant Low smoke (FRLS) wires" wire with terminations, as per detailed drawing and specification -

(i) Secondary point with switch (from switch board to first light point)  
(ii) Secondary point without switch (from light point to light point)

Wiring for 250 volts single phase and neutral 16 amps white modular polycarbonate cover plate, modular switched socket outlet including Terminations with 2 Nos. 2.5 sq.mm + 1No.1.5 Sq mm PVC insulated copper conductor stranded flexible 1100 volts grade flexible Fire Retardant Low smoke (FRLS) wires (for Ph., N + E) of approved make including 25mm dia. 2mm thick embedded PVC conduit from DB to point including providing and fixing of 16 amps 5 pin switch sockets of approved make and design in 1.6 mm thick GI back box with grid plates and earthing the third pin of each socket outlet, as per detailed drawing and specification. (For Laundry equipment)

Wiring for 250 volts single phase and neutral 6 amps white modular polycarbonate cover plate, modular switched socket outlet including Terminations with 2.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embedded PVC conduit from SB / DB to point & looped to lighting circuit including providing and fixing of 6 amps 3 pin switch socket outlet of approved make and design in 1.6 mm thick GI back box with grid plate and earthing of third pin of the socket with 1.5 Sq. mm PVC insulated copper conductor stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specification.

Wiring for Ceiling Fan point including Terminations with 1.5 sq.mm PVC insulated copper conductor 1100 volts grade stranded flexible "Fire Retardant Low smoke (FRLS)" wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embedded PVC conduits & looped to lighting circuit including providing fan hook box, 6 amps switch and 120 watts electronic fan regulator of approved make in GI box and earthing the fan and outlet box with 1.5 sq. mm. PVC insulated copper conductor stranded flexible Fire Retardant Low smoke (FRLS) wire, as per detailed drawing and specification.

Wiring for Exhaust fan point including Terminations with 1.5 sq.mm Insulated copper conductor 1100 volts grade stranded flexible Fire Retardant Low smoke (FRLS) wires (for Ph. & N) of approved make including 20mm dia. 2mm thick embedded PVC Conduit & looped to lighting circuit including providing and fixing of Ceiling Rose near the exhaust fan, as per detailed drawing and specification.

### TELEPHONE NETWORK

1. Providing and fixing 100 pair MDF at Ground floor.
2. Providing and fixing 10 pair telephone tag block (TTB) at every Typical Floors
3. Providing and laying of 10 Pair 0.51 sqmm Tin Copper telephone cable in 25mm dia PVC pipe in LV shaft from MDF to respective floor TTB for telephone network
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>4</td>
<td>Providing and laying of 5 Pair 0.51 sqmm Tin Copper telephone cable in 25mm dia PVC pipe in LV shaft from floor TTB to flat TTB (Average 10 Mtr. / flat)</td>
</tr>
<tr>
<td>5</td>
<td>Supplying &amp; fixing following rigid PVC FRLS Heavy Duty conduits thickness not less than 2mm with conduits accessories (clamps, coupling, junction boxes) &amp; GI Fish wire for pulling of wires in Slab - (i) 25mm dia. (From LV Box to floor TTB for Telephone &amp; TV Network) (ii) 25mm dia. (From floor TTB to Main MDF)</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td><strong>T.V. SYSTEM</strong></td>
</tr>
<tr>
<td>1</td>
<td>Providing &amp; laying following T.V. co-axial cables in 25mm dia. rigid PVC conduit from main spliter box to respective floor splitter boxes with necessary pull boxes as required - (i) R.G.-11 (U) Co-axial cable</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing following splitter boxes on all floors as shown in Layout Drawings - (i) 6 Way Splitter Boxes</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing following rigid PVC conduits &amp; conduits accessories (clamps, coupling, junction boxes) thickness not less than 2mm - (i) 25mm dia. (From LT Duct to Main TV system)</td>
</tr>
</tbody>
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<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>J</td>
<td><strong>LIFT POWER &amp; SHAFT LIGHTING</strong></td>
</tr>
<tr>
<td>1</td>
<td>Providing, fixing, Testing and commissioning 63Amps TPN Switch Fuse unit in powder coated enclosure for lift power in Lift Machine Room (For Passenger and stretcher Lifts)</td>
</tr>
<tr>
<td>2</td>
<td>Providing, fixing, Testing and commissioning 63Amps 4 pole ELCB, 100mA Sensitivity in powder coated enclosure for lift (For Passenger and stretcher Lifts)</td>
</tr>
<tr>
<td>3</td>
<td>Providing of M.S. box duly painted incorporating 2 Nos. 5 Amp. Switch and 1 No. 5 Amp 5 Pin socket piano type anchor make</td>
</tr>
<tr>
<td>4</td>
<td>Wiring to lift shaft, mid way light point &amp; 6 amp switch socket outlet with boxes with 3 Core. x 2.5 Sq.mm PVC insulated copper armoured cable surface run fixed with G.I. Spacers &amp; saddle &amp; end gland termination</td>
</tr>
<tr>
<td>5</td>
<td>Supply &amp; Installation of bulk head fitting</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>K</td>
<td><strong>CABLE TRAYS</strong></td>
</tr>
<tr>
<td>1</td>
<td>Providing, assembling and install following size of GI perforated trays and necessary support for wall &amp; ceiling including all hard wares as per site requirement complete as per specification and as directed - (i) 750mm Width (ii) 600mm width (iii) 150mm width</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>L</td>
<td><strong>AVIATION LIGHTS</strong></td>
</tr>
</tbody>
</table>
|   | Supply, fixing, testing & commissioning of Flashing Type "B" Twin aviation obstruction light (AOL L-864) with following details -  
(1) Input Voltage :- AC - 230 Vac +/- 3% , DC - 12 Vdc , 24 Vdc, 48 Vdc  
(2) Luminous Intensity 360° Radial :- >1500 Candela  
(3) Colour of Light :- Red, Wavelength 626 nm  
(4) LED Viewing angle :- 30°  
(5) No. Of Flashes :- 20 to 60 Flashes Per Minute (ADJ.)  
(6) Visibility LEDs :- 4.9 Kilometers , 5mm Round, Water Clear Lens  
(7) No. Of LEDs :-720 Nos.  
(8) Wattage :- 52 Watts Peak  
(9) Power Factor :- 0.95  
(10) Life Expectancy of LEDs :- App. 1,00,000 Hours  
(11) HV Testing :- 1K5 Voltage for 1 Min.  
(12) Ambient Light Sensor :- Light Dependant Resistor  
(13) Operation Controller :- Built in AC operation only  
(14) Lamp Base Material :- Aluminum LM6  
(15) Lamp Base External Finish:- Aviation Yellow  
(16) Upper Enclosure Dome :- Transparent Polycarbonate  
(17) Cable Entry :- 20mm Threaded with V2 " BSP  
(18) Hardware Dimensions :- Stainless Steel SS304 , W : 169mm and H: 235 mm  
(19) Weight:- 1.5 Kgs.  
(20) Conforms :- ICAO - Chapter 6 & Table 63 FAA - AC150 5345-43e  
(21) Ingress Protection :- IP65 - IEC 60947  |
<table>
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<tbody>
<tr>
<td></td>
<td>Wiring for 250 volts single phase and neutral 6 amps socket outlet near aviation obstruction light.</td>
</tr>
<tr>
<td>3</td>
<td>Supply &amp; Installation of 24 x 7 Timer for control of aviation obstruction light.</td>
</tr>
<tr>
<td>4</td>
<td>Mounting Mast (Pole) : Supply &amp; install steel fabricated FRP mast shall be clamp on to steel mast from the side, with 'U' bolt &amp; the terminal can be fitted on to the FRP mast directly with suitable base plate, termination arrangement for the Down-Conductor.</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing Junction Box all complete for termination of 3C x 2.5 sqmm copper cable for aviation obstruction light (from)</td>
</tr>
<tr>
<td>6</td>
<td>Providing and laying 3C x 2.5 sqmm copper cable for aviation obstruction light with terminations of cables</td>
</tr>
<tr>
<td>M</td>
<td><strong>MISCELLANEOUS ITEM</strong></td>
</tr>
</tbody>
</table>
| 1 | Providing and laying RCC Hume Pipes non pressure NP-2 class with collar, joined with the stiff mixture of cement mortar 1 : 2 (1 cement : 2 fine sand) of sizes as given below, 1000 mm deep under the road for passing electric cables including necessary excavation, refilling and disposal of surplus soil within plot complete all as specified -  
(i) 300 mm dia. ( For LT Cables )  
(ii) 100mm dia. ( For LV Cables )  
(iii) 150 mm dia.  |
| 2 | Supplying and erecting cable route markers for LT cables including PCC base  |
### Material and Labour for Construction of Brick Masonry Under Ground Cable Chamber

Bricks of class designation 3.5 (average compressive strength not less than 35 kgs per sqcm.) and sub class B in cement mortar 1:5 (1 cement : 5 coarse sand) with frame and covers as mentioned below, fixed in PCC coping 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) including necessary excavation in any type of soil, foundation concrete 150mm thick 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) and inside and outside plaster with cement mortar 1:4 (1 cement : 4 coarse sand) 20mm thick and inside plaster finished with floating coat of neat cement as per standard design, including disposal of excavated earth within plot all as specified:

(i) 1350mm X 900mm X 900mm deep (For LT Cables)
(ii) 600 mm X 600mm X 600mm deep (For LV Cables)

### Lighting Fixtures & Appliances (Common Area)

Supply, Unloading, Handling, Installation, testing & commissioning of following surface / recessed type lighting fixtures complete with lamps, control gear & electronic ballasts, all fixing accessories such as downrope etc. as directed:

1. **Wall Mounted 10W 2 Feet LED Tubelight (For Staircase, Stilt area, Stilt Toilet)**
2. **Weather Proof Wall Mounted 10W 2 Feet LED Tubelight (For Refuge area)**
3. **Wall Mounted 7 W LED Bracket Light (For Stilt toilet)**
4. **False Ceiling Recessed 12 W LED Ceiling Mounted Downlighter (For Entrance lobby & Canopy)**
5. **Ceiling Mounted 12 W LED Light (For Lift Loby at all floors)**
6. **Lift Machine Room exterior Wall Mounted weather proof 50 W Flood Light (For Terrace floor)**
7. **Exhaust fans BEE FIVE star certified 300mm sweep (For Stilt toilet)**
8. **Ceiling fans BEE FIVE star certified 1200mm sweep with double ball bearing, three blades, white colour complete with speed Regulator (For Laundry)**
9. **Street pole 25 W LED light fixtures**
10. **1.2M Height Bollard Light with 9W LED lighting fixture**

### Street Pole Lighting

Supply and erection of swaged steel tubular pole conforming to IS-2713 of sizes as given below for fixing street light fixtures and brackets. Complete with base plate 300mmx300mmx6mm, drilling of hole for entry of wires and including excavation, concrete 1:2:4 for foundation. Provisioning and fixing of weather proof junction box of size 200mm x 150 mm x 75mm made out of 2mm thick MS sheet with hinged cover and rubber gasket, and filled with 6 Amps bakelite fuse and connector, earthing stud and two 25mm dia G.I. pipes (light grade) each of 1 mtr. length for cable protection and cable glands. Providing and drawing two nos. single core 2.5 sqmm PVC insulated stranded copper conductor cables of 1100V grade ISI marked from junction box to the street light luminair / fixture on the pole. Steel pole and junction box painted with two coats of aluminium paint over one coat of steel primer complete all as specified.

1. **Overall length 3.5 mtrs and approximate weight as per IS standard with swan neck GI Pipe Bracket suitable for fixing 25 watts LED street light fixtures.**
Supplying, assembling, erecting, testing and commissioning of L.T. weather proof, dust and vermin proof, out door feeder pillar fabricated of suitable size MS Angle, MS flats and 3mm thick CRCA sheet steel including canopy, duly stove enamel painted, both side openable with locking arrangement, neoprene, gasket, cable gland, 4 TPN copper bus bar etc. (as per Service Provider requirement) including PCC details as per detailed drawing and specification.

1 TPN outdoor feeder pillars with HRC fuses for incoming and outgoing circuits as under:
   (i) 1 No. Incoming circuit, each with 3 numbers 400 Amps, WITH HRC fuse with fuse base
   (ii) 1 No. Incoming circuit, each with 3 numbers 400 Amps, WITHOUT HRC fuse with fuse base
   (iii) 500A TPN Copper bus bars
   (iv) 2 Nos. outgoing circuits, each with 3 numbers 400 Amps, WITH HRC fuse with fuse base.
   (v) 1 No. outgoing circuit, each with 3 numbers 150

1.1 6 Way SPN MCB DB for EXTERNAL TIMER LIGHTING DB - 1 No, comprising of -
   (i) **INCOMER** -
      (a) 1 No. 40 Amp. DP MCB 10kA
   (ii) **OUTGOING** -
      (a) 2 Nos. 10 Amp. SP MCB (10 KA)
      (b) 2 Nos. Blank Plates
      (c) 1 No. Legrand / Schneider / Siemens make 24 x 7 Timer & Contactor for external lighting control in enclosure

**PART 3  DG SET**

DG set fully under weather proof and acoustic enclosure with AMF panel having following specifications -
   a. Capacity- 320 KVA
   b. Energy efficient and CPCB compliant
   c. Microprocessor based controller
   d. Noise level less than 75 dBA.
   As per detailed scope of work.

**PART 4  LIFT**

2 nos. passenger lifts (10 P) & 1 No. stretcher (15 P) lift with gearless machine, microprocessor based drive (VVF or above), having machine room at top, with G+20 stops (including terrace floor), with speed not less than 1.75mps, as per detailed scope of work.

**PART 5  PV SOLAR SYSTEM**

20 kWp grid connected Solar PV power system without battery back up, directly connected to main electrical feeder of building through net metering system. To be installed in shadow free roof top of building with necessary metal structure. Having suitable inverter to generate 3 phase 415 V AC output. The system should be as per MNRE standard and the components used should be MNRE approved. As per detailed scope of work and with 5 year warranty.
### SPECIFICATIONS

#### FIRE FIGHTING

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Wet Riser System</td>
</tr>
<tr>
<td>1</td>
<td>Excavation in all soils other than Hard and soft rock for the following depth not exceeding 1.5 Meters from ground level including dewatering, providing proper and adequate shoring and strutting where required refilling the trenches with selected excavated earth in layers not exceeding 230mm thick, watering, consolidation all complete as per specification and direction of the Engineer-in-charge.</td>
</tr>
<tr>
<td>2</td>
<td>Providing and fixing heavy class G.I. pipes (ERW Quality Conforming to IS 1239 with welded joints to correct grade/alignment including cutting the pipes to correct length, providing and welding G.I. pipes jointing by means of arc welding, providing and fixing with heavy M.S. brackets/hangers anchor fastner of app. design, testing to 15 Kgs/cm2 pressure, rectifying the leakages if any, painting all complete as per specification and direction of the Engineer-in-charge for the following diameters (Including Fittings.) (For Riser Piping)</td>
</tr>
<tr>
<td>2.1</td>
<td>200mm dia.</td>
</tr>
<tr>
<td>2.2</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>2.3</td>
<td>100mm dia.</td>
</tr>
<tr>
<td>2.4</td>
<td>75mm dia.</td>
</tr>
<tr>
<td>2.5</td>
<td>25mm dia.</td>
</tr>
<tr>
<td>3</td>
<td>Providing and fixing heavy class G.I. pipes (ERW Quality Conforming to IS 1239 with welded joints to correct grade/alignment including cutting the pipes to correct length, providing and welding G.I. pipes jointing by means of arc welding, with rustic tape wapping to the under ground ring main piping all complete. (Including fittings)</td>
</tr>
<tr>
<td>3.1</td>
<td>200mm dia.</td>
</tr>
<tr>
<td>3.2</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>3.3</td>
<td>75mm dia.</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing 65mm dia G.M. Twin outlet flanged inlet oblique type fire hydrant landing valve with C.I. hand wheel, plunger type female instantaneous coupling with chained blank cap including making flanged joints by providing necessary G.I. nuts, bolts, gaskets etc.all complete as per specification and direction of the Engineer-in-charge.</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing 20mm dia. Automatic (HAWA Make) air release valve including providing and fixing cut off &amp; drain valve, making necessary inlet/outlet connection and fixing with M.S. Brackets complete.</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing best approved quality Reinforced Rubber Lined Canvas Hose pipes 63mm dia.15 Meters long with one male and female (Plunge type) instantaneous couplings either ends including providing Copper (long type) branch pipes having instantaneous male coupling at one end and screwed type (20mm bronze) jet nozzle at the other end complete as per specifications.</td>
</tr>
<tr>
<td></td>
<td>Providing and fixing approved drum type wall mounted hose reels, swivelling 180 degrees consisting of 19mm dia x 30 M long best approved armoured rubber hose pipe with 6.3mm dia bronze shut off type jet nozzle, making connection to the vertical riser by cutting welding, providing (300 PSI) cut off valve 20mm dia and necessary piping, fittings, providing and fixing the hose reel with necessary anchor fasteners by drilling holes in walls/RCC making good the same all complete as per specification and direction of the engineer-in-charge.</td>
</tr>
<tr>
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</tr>
<tr>
<td>8</td>
<td>Providing and fixing shutters only fabricated out of M.S.sheets (16 gauge) including double shutters of 4mm thick float glass with locking arrangement and lever for opening the door after breaking the glass, including painting the frame and shutter with two coats of enamel paint over two coats of Zinc Cromate primer, embossing Fire Symbol on the glass shutters, grouting the same/providing and fixing with hor bolts complete as per drawings, specifications of the following sizes:</td>
</tr>
<tr>
<td>8.1</td>
<td>1500mm x 900 mm nearest to suit site conditions.</td>
</tr>
<tr>
<td>8.2</td>
<td>Siamese connection (size 1500 x 600 x 450 or nearest to suit site conditions).</td>
</tr>
<tr>
<td>9</td>
<td>Providing and fixing fire hose box fabricated out of M.S. sheets (16 gauge) including double shutters of 4mm thick float glass with locking arrangement and lever for opening the door after breaking the glass, including painting the frame and shutter with two coats of enamel paint over two coats of Zinc Cromate primer, embossing Fire Symbol on the glass shutters, grouting the same/providing and fixing with anchor bolts complete as per drawings, specifications of the following sizes:</td>
</tr>
<tr>
<td>9.1</td>
<td>750mm x 750 x 250 deep or nearest to suit site conditions. (For External Court Yard Hydrant)</td>
</tr>
<tr>
<td>10</td>
<td>Providing and fixing Fire Brigade inlet connection Fabricated out of 100mm dia G.I. pipe of suitable length with provision for 4 inlet with male instantaneous couplings painting with 2 coat of enamel paint over a coat of primer all complete as per specification and direction of the Engineer-in-charge.</td>
</tr>
<tr>
<td>10.1</td>
<td>Connection to Fire Tanks</td>
</tr>
<tr>
<td>10.2</td>
<td>Connection to Fire Fighting System.</td>
</tr>
<tr>
<td>11</td>
<td>Providing and fixing court yard Fire Hydrants as per IS:5290 consisting of 63mm dia. single outlet flanged oblique type hydrants valve with instantaneous female plunger type coupling, chained blank cap including making flanged joints by providing necessary nuts bolts, gaskets (6mm thick Neoprene) all complete as per specifications suitable for 80mm dia stand post.</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing heavy approved quality cast iron double flanged recoil type non-return valves including making flanged joints by providing necessary nuts, bolts, gaskets (6mm thick), painting all complete as per specifications for the following diameters.</td>
</tr>
<tr>
<td>12.1</td>
<td>200mm dia</td>
</tr>
<tr>
<td>12.2</td>
<td>150mm dia</td>
</tr>
<tr>
<td>12.3</td>
<td>65mm dia</td>
</tr>
<tr>
<td>13</td>
<td>Providing and fixing cast iron Butterfly valve as per IS 780 with C.I. working parts. (PN: 20)</td>
</tr>
<tr>
<td>13.1</td>
<td>200mm dia.</td>
</tr>
<tr>
<td>13.2</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>13.3</td>
<td>65mm dia.</td>
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</tr>
<tr>
<td>14</td>
<td>Providing and fixing Brass heavy approved make ball valves screwed type of the following diameters (16 Kg/cm²)</td>
</tr>
<tr>
<td>14.1</td>
<td>25mm dia.</td>
</tr>
<tr>
<td>15</td>
<td>Providing and fixing C.I. Strainer 'Y' type with matching screwed type flanges.</td>
</tr>
<tr>
<td>15.1</td>
<td>200mm dia.</td>
</tr>
<tr>
<td>15.2</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>15.3</td>
<td>75mm dia.</td>
</tr>
<tr>
<td>15.4</td>
<td>65mm dia.</td>
</tr>
<tr>
<td>16</td>
<td>Providing and fixing gun metal screwed heavy approved quality foot valve with strainer including making flanged joints by providing and fixing nuts, bolts, gaskets etc. complete of the following diameter</td>
</tr>
<tr>
<td>16.1</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>16.2</td>
<td>65mm dia.</td>
</tr>
<tr>
<td>17</td>
<td>Providing and fixing bronze orifice disc for fire hydrant system to control the pressure within 5.5 Kgs/cm² all complete as per specification and direction of the Engineer-in-charge (nominal diameter ranging from 50mm to 15mm)</td>
</tr>
<tr>
<td>17.1</td>
<td>50mm-15mm Centre Orifice dia.</td>
</tr>
</tbody>
</table>

**B Sprinkler System**

<p>| 1    | Providing and fixing heavy class G.I. pipes (ERW Quality Conforming to IS 1239 with welded joints to correct grade/alignment including cutting the pipes to correct length, providing and welding G.I. pipes jointing by means of arc welding, providing and fixing with heavy M.S. brackets/hangers anchor fastner of app. design by testing to 15 Kgs/cm² pressure, rectifying the leakages if any, painting all complete as per specification and direction of the Engineer-in-charge for the following diameters (Including Fittings.) |
| 1.1  | 200mm dia. |
| 1.2  | 150mm dia. |
| 1.3  | 100mm dia. |
| 1.4  | 75mm dia. |
| 1.5  | 65mm dia. |
| 1.6  | 50mm dia. |
| 1.7  | 40mm dia. |
| 1.8  | 32mm dia. |
| 1.9  | 25mm dia. |
| 1.10 | 20mm dia. |
| 2    | Providing and fixing approved equivalent (Type F) UL/FM listed quartzoid bulb sprinkler head with temperature rating 68 deg. C. with universal deflector as approved by CFO. complete. |
| 2.1  | 15mm dia. (Pendant type) |
| 2.2  | 15mm dia. (side throw type) with rossette |
| 2.3  | 15mm dia. x 1.5 M long (Flexidrop) with Rossette |
| 3    | Supplying and installing approved make flow switches (flow sensors) suitable to be fixed directly on line of the following diameters including necessary cabling from sensors to Alarm Panel. |
| 3.1  | 65mm dia. |</p>
<table>
<thead>
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<tbody>
<tr>
<td>3.2</td>
<td>40mm dia.</td>
</tr>
<tr>
<td>4</td>
<td>Providing and fixing heavy approved quality cast iron double flanged recoil type non-return valves including making flanged joints by providing necessary nuts, bolts, gaskets (6mm thick), painting all complete as per specifications for the following diameters.</td>
</tr>
<tr>
<td>4.1</td>
<td>150mm dia</td>
</tr>
<tr>
<td>4.2</td>
<td>65mm dia</td>
</tr>
<tr>
<td>5</td>
<td>Providing and fixing cast iron Butterfly valve as per IS 780 with C.I. working parts. (PN:20)</td>
</tr>
<tr>
<td>5.1</td>
<td>150mm dia</td>
</tr>
<tr>
<td>5.2</td>
<td>65mm dia</td>
</tr>
<tr>
<td>5.3</td>
<td>Providing and fixing C.I. Strainer 'Y' type with matching screwed type flanges.</td>
</tr>
<tr>
<td>5.4</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>5.5</td>
<td>65mm dia.</td>
</tr>
<tr>
<td>6</td>
<td>Providing and fixing gun metal screwed heavy approved quality foot valve with strainer including making flanged joints by providing and fixing nuts, bolts, gaskets etc. complete of the following diameter</td>
</tr>
<tr>
<td>6.1</td>
<td>150mm dia.</td>
</tr>
<tr>
<td>6.2</td>
<td>65mm dia.</td>
</tr>
<tr>
<td>7</td>
<td>Providing and fixing Brass heavy approved make ball valves screwed type of the following diameters (16 Kg/cm²)</td>
</tr>
<tr>
<td>7.1</td>
<td>40mm dia.</td>
</tr>
<tr>
<td>7.2</td>
<td>25mm dia.</td>
</tr>
<tr>
<td>8</td>
<td>Providing and fixing 9 liters capacity sand buckets with initial sand fill including, painting providing necessary brackets/ clamps proper supports as required and directed by the Engineer-in-charge.</td>
</tr>
<tr>
<td>9</td>
<td>Providing and fixing portable fire extinguishers dry chemical powder 6 Kg. Capacity suitable for wall mounting including fixing the same with brackets clamps anchor fasteners drilling holes making good the same painting the surface as required as per the directions of EIC</td>
</tr>
<tr>
<td>10</td>
<td>Providing and fixing ABC portable fire extinguishers dry chemical powder 10 Kg. Capacity suitable for wall mounting including fixing the same with brackets clamps anchor fasteners drilling holes making good the same painting the surface as required as per the directions of EIC</td>
</tr>
<tr>
<td>11</td>
<td>Providing and fixing Co2 type fire extinguishers 2 Kg. Capacity with ISI Mark suitable for wall mounting including fixing the same with brackets clamps anchor fasteners drilling holes making good the same painting the surface as required as per the directions of EIC</td>
</tr>
<tr>
<td>12</td>
<td>Providing and fixing 20mm dia. Automatic (HAWA) air release valve including providing and fixing cut off &amp; drain valve, making necessary inlet/outlet connection and fixing with with M.S. Brackets complete.</td>
</tr>
<tr>
<td></td>
<td>Providing and fixing C.I. double flanged installation control valve with Alarm Gong, consisting of installation stop valve, Alarm valve drain 50mm dia. and 15mm dia. test valve, pressure gauges on inlet and outlet with alarm motor and gong, alarm valve clack with padlock and stop drain plug, alarm stop valve and strainer including making inlet/outlet connections by providing necessary nuts, bolts, gaskets all complete (G.I.Pipes shall be measured and paid separately under relevant items)</td>
</tr>
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</tr>
<tr>
<td>13</td>
<td>Size 150mm dia</td>
</tr>
<tr>
<td><strong>C Fire Pumping System</strong></td>
<td><strong>Note:</strong> Fire Fighting Contractor shall provide R.C.C. foundations with vibration pads in accordance with the specifications of Manufacturers. No extra shall be paid on this account.</td>
</tr>
<tr>
<td>1</td>
<td>Fire Hydrant Pump (Electrical)</td>
</tr>
<tr>
<td>1.1</td>
<td>Supply, installation, testing and commissioning of centrifugal type multistage single outlet diffuser Horizontal type fire fighting pump having cast iron casing, alloy bronze impellers and diffusers AISI 304, stainless steel shaft running in Taper roller thrust bearing at either end. Pump shall be directly coupled to 100 HP 2900 RPM 415 V 50 cys. AC 3 phase squirrel cage TEFC motor, capacity 2400 LPM at @ 100 Mt. head with from all causes including pressure guages etc.</td>
</tr>
<tr>
<td>2</td>
<td>Fire Sprinkler Pump (Electrical)</td>
</tr>
<tr>
<td>2.1</td>
<td>Supply, installation, testing and commissioning of centrifugal type multistage single outlet diffuser Horizontal type fire fighting pump having cast iron casing, alloy bronze impellers and diffusers AISI 304, stainless steel shaft running in Taper roller thrust bearing at either end. Pump shall be directly coupled to 100 HP 2900 RPM 415 V 50 cys. AC 3 phase squirrel cage TEFC motor, capacity 2400 LPM at @ 100 Mt. head with from all causes including pressure guages etc.</td>
</tr>
<tr>
<td>3</td>
<td>Jockey Pumps (Electrical)</td>
</tr>
<tr>
<td>3.1</td>
<td>Supply, installation, testing and commissioning of centrifugal type single outlet diffuser centrifugal pump of capacity 180 LPM at 100 Mt. head with 7.5 H.P. 2900 RPM Motor including all accessories.</td>
</tr>
<tr>
<td>4</td>
<td>Booster Pump</td>
</tr>
<tr>
<td>4.1</td>
<td>Providing and installation of fire hydrant booster pump of capacity 900 LPM @ 3.2 Kg/cm2 working pressure coupled to 12.5 H.P. 2900 RPM, 400/440 V, 50 cycles A.C.3 Phase TEFC motor complete with common base plate, including providing and fixing suitable control panel at entrance level or as required including providing and fixing necessary cables from pump to panel complete.</td>
</tr>
<tr>
<td>5</td>
<td>Pressure Vessel</td>
</tr>
<tr>
<td>5.1</td>
<td>Supplying of (vertically) mounted M.S.fabricated pressure vessels made from 8mm M.S. Plate as per I.S. 2062, 300mm in diameter and 1.2 Meter high shell with dished ends at top and flat bottom with floor mounting supports including 25mm outlet, inlet and Branch for Pressure gauge complete. The interior of the tank surface shall be coated with suitably graded Non-Toxic epoxy coating after necessary surface treatment by sand blasting, etc. to prevent corrosion of the vessel and shall be painted externally with 3 coats of enamel paint over one coat of Zinc Chromate primer including all accessories for complete installation as required.</td>
</tr>
</tbody>
</table>
5.2 Providing and fixing Air Cushion Vessels of 300mm dia. 1.2 mt Height complete with outlet/ inlet connections, valves and fittings all complete.

6 Control Panel (Fire Pump)

6.1 Tenderer shall provide any all suitable cables as required for respective Panels & incoming & outgoing Copper Conductor PVC 1.1 KV grade to pump for complete working of the system at no additional cost.

6.2 Supplying, erecting, connecting, testing and commissioning of wall mounting/floor mounting cubical type compartmentalized, dust, damp, vermin proof L.T fire fighting pump control panel with allied accessories including and with cable terminations arrangement etc. Fabricated out of suitable size M.S. angle Iron and M.S. flats and covered with 2mm thick cold rolled CRCA Sheet duly powder coated paint etc. complete with copper bus bar, inter connection with solid/ stranded copper conductor wires/copper strips, neutral link etc. and mounted with switch gears, star delta starter with reset over load relay, single phase preventor, voltmeter, ammeter alongwith CT’s & selector switch.

6.3 Necessary pressure switches & pressure gauges copper cable between panel (Pump room and booster pump at terrace) to motor and panel to various pressure switch control, complete with necessary termination and earthing including providing switch gear & star delta starter near booster pump, push button ON/OFF control in the fire panel shall be included in the above cost.

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<table>
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<tbody>
<tr>
<td>Fire Hydrant Pump (100 H.P.)</td>
<td>1 No.</td>
</tr>
<tr>
<td>Jockey Pump (7.5 H.P.)</td>
<td>2 Nos.</td>
</tr>
<tr>
<td>Sprinkler Pump (100 H.P.)</td>
<td>1 No.</td>
</tr>
<tr>
<td>Booster Pump (12.5 H.P.)</td>
<td>1 No.</td>
</tr>
</tbody>
</table>
BRIEF SCOPE OF WORK

A. SITE:-

1. Site Location:- Near Block No 5, BPCL Staff Colony, Azizbaug, Chembur, Mumbai- 400 074. The site is well accessible from RC Marg, Chembur.

2. The bidders are advised to visit and examine the site of works location and their surrounding and obtain for himself on his own responsibility all information that may be necessary for preparing of the bid and entering into the contract. The costs of visiting the sites shall be at bidder's own expenses. No extra claim on account of non-familiarity of site conditions shall be entertained during execution of works.

3. Scope includes shifting of any scrap materials/excess earth lying at the constructional area to the designated place inside premises at no extra cost. Job also includes site clearing from any debris, vegetation, bushes and trees, etc and make the site free for construction within the parameters prescribed by the green norms of GRIHA & local statutory bodies.

B. PROJECT SCOPE:-

1. The Project is lump sum turnkey project which includes construction of buildings as per drawings, designs, specifications, scope of work etc. tender documents on Corporation’s land and development of land with all infrastructures as mentioned in tender.

2. The various works described in the Schedule of Items, specifications, scope of work and in the drawings shall be executed in strict accordance to the entire satisfaction of the Architect-PMC/BPCL. The quality of materials and workmanship shall be of high quality and shall conform to the relevant I.S. Specifications wherever applicable. The successful bidders will be required to produce for samples of material for approval. Contractor should procure only approved quality of material. Samples of finished work shall also be shown for Architect-PMC/BPCL approval wherever directed. Finished work shall conform strictly to the approved samples. The decision of the Architect-PMC /BPCL in this matter will be final.

4. Scope includes construction of Reinforced Cement Concrete Frame Structure building including all electrical, water supply, Sewerage Disposal System, Fire fighting system, solar system etc as per detailed tender document & drawings and other works such as site survey, site cleaning, land demarcation, Leveling of Site by cuttings & fillings including conveyance of any excess excavated material within layout of BPCL or outside of staff colony, Drains, Shifting & Replacement of existing Electrical /Telephone lines, by underground cabling, Dismantling existing structures coming in the way of construction & remaking a good as per requirements etc. on turnkey basis along with necessary permissions from competent authorities.

5. Detailed construction drawings, supplementary and explanatory drawings shall be given to the contractor during execution along with Instructions on site. During execution, contractor should obtain obtaining necessary permission, No Objection Certificate (NOC), Completion Certificate, Licenses, from various competent authorities, including payment of all fees / deposits / charges / penalties / hardships/fines, supervision charges/any other charges etc. if any required to be paid to various local/public statutory authorities (such as MCGM, PWD or any other statutory authority etc.) related to construction works on behalf of BPCL to any professional organization / agency / expert person as requirement and up to completion of this project and to the complete satisfaction
of Bharat Petroleum Company Ltd. Mumbai.

6. All expenses required for above and other works shall be deemed to have been included in the lump sum offer mentioned in the tender document.

7. Work shall not be considered as complete, unless all items in schedule of items are complete along with additional items if instructed and all works as shown on drawings along with additional details issued at the time of execution, modifications in drawings if any and instructions given on site by the client from time to time. Electric and water supply to the building is commissioned i.e. to say work complete in all respects to make the building ready for use and occupation certificate and p-form & C form for water connection including physical water connection and all infrastructural amenities.

8. After award of job, contractor should submit a detailed work plan and Bar chart incorporating work schedule for different jobs in manner so that work can be completed as per time schedule mentioned.

9. The normal working hours for carrying out the job shall be from 8.00 A.M up to 6.00 PM on working days (from Monday to Saturday). However the work can be continued on Sundays/holidays/during the night hours subjected to the permission given by the Architect-PMC/BPCL and subject to no complaints received from neighbors and police etc. in line with the prevailing statutory regulation.

10. The bidders shall take maximum precaution in protecting persons, things and properties belonging to the BPCL and also their own during the progress of work. The bidders will be solely responsible for any damage caused during the progress of work and the successful bidder shall indemnify the BPCL by suitable guarantee / insurance cover from any claims on any account due to damages caused during their work.

11. The Contractor shall provide at his own cost all necessary storage on the site in a specified area for all materials such as Steel, cement, Blocks, sand etc. and other materials, which is likely to deteriorate by the action of sun, rain or other causes due to exposure, in such a manner that all such materials, tools, etc., shall be duly protected from damage by weather or any other cause. All such stores shall be cleared away and the ground left in good and proper order on completion of this contract unless otherwise expressly mentioned therein.

12. The contractor shall provide at his own cost temporary works as per drawings/specifications approved by the Architect-PMC/BPCL. The contractors should obtain approval of local authorities, if required for the same. The Contractor shall be responsible for removal and disposal of the temporary works before handing over the completed works to the Architect-PMC/BPCL.

13. The Contractor shall erect display boards on site at his cost in accordance with the requirements, drawings issued by the Architect-PMC/BPCL for display of the site name/information, safety information etc. of the project.


15. The contractor has to maintain all the site records including measurement sheet, hindrance
register, Daily progress register, testing registers, level books and other site records as mentioned in the clause- ‘Documents to be maintained at site’ in coordination with Architect-PMC/BPCL on a daily basis.

C. SITE PREPARATION:-

1. The contractor shall carry out layout of building and roads before commencement of work and ensure that buildings fit within the plot and also match properly with existing roads, road levels, drainage invert levels etc. The entire work of layout and levels shall be got approved from the Architect/BPCL.

2. Contractor should arrange to barricade the full site with 6m height barricading made of G.I. Sheets in green colour supported on Structural steel sections as per specifications mentioned in the tender documents. The details of barricading shall be got approved from consultant before erection.

3. The plot for building shall be leveled by cutting and filling with suitable grading compacting etc. The plinth level shall be as shown in the drawing i.e. 150mm above formation level. (which will be 150mm above the level of center of existing road) Plinth protection shall be made at 150mm above formation level with proper slope. Plinth level shall be as per drawing and as decided by Architect and with due consideration to proper drain out of storm water, disposal of sewage through underground sewerage disposal pipe line.

4. The entire area of project outside the building line, Open Space as per approved design, should be leveled with proper slopes. If any deficiency found in levels in plot, shall be made good by the Contractor by filling/ cutting existing ground. If additional quantity of murum is required for filling. Contractor shall bring approved quality of murum, from outside at his cost. It should be compacted in layers of 25 cm by power roller, including dressing, consolidating, watering etc. complete as directed by the Architect-PMC/BPCL.

5. During course of construction work, the Contractor (s) shall make all necessary arrangements for ensuring proper drainage of the site by providing Hume pipe, channels, temporary crossings, etc. as may be required to be provided according to the directions of the Architect-PMC/BPCL. Contractor should submit his proposals for ensuring the drainage of the site by taking into consideration the final drainage plan proposed in the project and for carrying out the works in the manner approved by the Architect-PMC/BPCL. No extra payment shall be made for this.

6. The Contractor will be required to provide and work at his own cost all pumps, engines and machinery requisite to keep the trenches for the sewer, drains, foundations and all other excavations clear of water whether subsoil water, storm waste or leakage from tanks, wells, drains, sewers, water-mains etc. so that there may be no accumulation of water and work can be carried out easily. The pumping shall be continued so long for any portion of the work site as the Engineer-in-charge may consider necessary for the work to set. For the purpose of keeping the excavations as dry as possible the work would, if necessary be divided into sections or separate portions as per best engineering practices and temporary dams will have to be put up by the Contractor, sumps for the suction pipes to work in, will have to be excavated by the Contractor, disused sumps being filled up by him with dry rubble carefully hand packed to the satisfaction of the Engineer-in-charge. The Contractor will not be paid extra for any temporary dams or sumps or their removal or refilling nor will such works be taken into measurement in any way, unless otherwise provided.
7. The Contractor shall provide a site office for use of site engineers as per the approved specifications of Architect-PMC/BPCL along with one Personal Computer, one A3 & A4 size laser printer, internet connection & required storage space in the site office, office furniture including tables and chairs as indicated by the Architect-PMC/BPCL.

8. On receipt of the work order, the contractor will have to erect ready-made, one site chowky, in form of porta cabin/ container cabin, with appropriate insulation from heat, before commencement of the work. No separate payment will be made for providing the chowky and ancillary items mentioned. One security guard should be posted continuously to look after the site premises.

9. During the execution of work, it is likely that the contractor may meet with underground / over head live or dead telephone cable, electrical cables, poles, existing live / dead water supply or sewer's lines etc., it will therefore, be the responsibility of the Contractor to protect them carefully, in all such cases it should be brought to the notice of the Architect-PMC/BPCL by the Contractor and also to the Architect-PMC/BPCL. Any damage whatsoever done to these cables and pipelines or any type of structures if any, by the Contractor, shall be made good by him at his cost as directed by Architect-PMC/BPCL.

16. The contractor shall remove; shift existing electrical poles / lines, telephones lines, cables, water supply lines, sewers lines, trees, or any structure coming in the way of construction if any. Contractor shall remove, replace, and reconnect or reconstruct all necessary concerned structures on his own cost & as directed by the BPCL. Further if any charges are to be paid to the concerned authority may also be paid by the contractor only. The contractor shall also take all necessary permission in this regard at his own cost.

17. If any delay of shifting of existing electrical poles ,telephone lines, water pipe lines, cutting and shifting of trees and other structures obstructing the work, no compensation on account of delay will be entertained.

18. It will be the responsibility of the Contractor(s) to keep the site free from any encroachments. He will be required to take at his own cost measures to protect the site from such encroachment and keep the site free from all encumbrances till final completion of work and handing over the site to the concern authorities of BPCL.

19. Developments of land and provisions of infrastructure to be provided by the Contractor (s) would include the following works:
   a. To make the availability of water and electricity for construction purpose is the sole responsibility of tenderer.
      i) Drinking water will be made available by the BPCL if possible on chargeable basis. However, necessary permissions should be taken by Contractor from MCGM Water Dept/ statutory authorities for such use. Also, the storage, tapping and distribution etc. will be the responsibility of the Contractor. However, in case of non-availability of BPCL's water source / short supply etc., the responsibility of making the water available is remains with the Contractor.
      
      ii) It is Contractor's responsibility to ensure that the electric supply is maintained during execution. Contractor should arrange electricity supply for execution. The electric power supply source may be made available at site by BPCL if possible. However, necessary permissions should be taken by Contractor from Electricity Supply Company/ statutory authorities for such use. However, the Contractor shall make his own arrangements for
temporary supply, tapping and distribution of the same as per the works requirement. The Contractor may require taking necessary permissions from power Supply Co. for temporary connections as well as additional supply required, if any.

iii) Applicable water & sewerage and Electricity charges shall be charged by BPCL to the contractor. Contractor should pay such amount to BPCL on Monthly basis or else such amount shall be deducted from RA Bills of Contractor.

b. Construction of temporary structure/ retaining walls etc. wherever required for progress of works as per directions of Architect-PMC/BPCL. Detailed execution drawings and design shall be provided as per site conditions at the time of execution.

c. Access roads, site drainage channels, toilets for labours & staff, Conservation of trees by required material etc.

D. INSPECTION OF WORKS:-

1. The contractor shall supervise the execution of the works and shall appoint competent Civil Engineers, well-experienced in construction of similar projects, approved by the Architect-PMC and BPCL on site, to act on his behalf with full powers, authorities, and responsibilities. The contractor shall submit such Power of Attorney in the name of such engineers and supervisors to the Architect-PMC/BPCL. Contractor will have to appoint below Engineers, supervisors to execute the jobs:-

   a. One B.E. Civil with having an experience of 10 years in execution similar projects and shall be in charge of complete work and shall be available on site on daily basis.

   b. Second B.E.Civil having an experience of min. 5 years or Diploma Civil having an experience of min. 7 years of similar projects, surveying, & in reading of building drawings, structural drawings, for carrying out construction activities, record keeping etc. and shall be available on site on daily basis

   c. Third Diploma civil engineer having an experience of 3 year & more in execution for actual work, quality control, billing etc. and shall be available on site on daily basis

   d. The contractor shall appoint one qualified B.E. Electrical engineer for internal & external electrical works having an experience not less than 5 years in execution as per the requirement of BPCL/PMC.

   e. 2 Nos of Experienced Civil supervisors for supervising the all civil works on site and 1 No of Experienced Electrical supervisor for supervising electrical works on site.

   f. Additional Engineers/Supervisors as per requirement of site or as per requirement informed by PMC/BPCL.

2. Orders given to the contractor’s engineers/supervisors shall be considered to have the force as if these had been given to the contractor himself. If the contractor fails to appoint suitable engineers/supervisors as directed by the BPCL, the BPCL Engineer in- charge shall have full powers to suspend the execution of the work until the contractor appoints such responsible engineers/supervisors. Delay so caused shall not be entitled either for any compensation or for time extension.

3. The contractor shall inform the Architect-PMC/BPCL in writing when any portion of the work is ready for inspection giving him sufficient notice in advance to enable him to inspect the same without affecting the further progress of the work. The work shall not be considered to have been completed in accordance with the terms of the contract until the Architect-PMC/BPCL shall have
certified in writing to that effect. An approval of materials or workmanship or approval of part of the work during the progress of execution shall not bind the PMC/BPCL or in any way affect him even to reject the work which is alleged to be complete and to suspend the issue of his certificate of completion until such alteration and modifications or reconstruction have been effected at the cost of the contractor as shall enable him to certify that the work has been completed to his satisfaction.

4. The Contractor should provide complete access to the Engineers, supervisors of Architect-PMC/BPCL and arrange at his own cost necessary ladders and such arrangements as to provide necessary facilities and assistance for proper inspection of all parts of the work at his own cost.

E. RESIDENT ENGINEER OF CONTRACTOR AND WORK ORDER BOOK:-

1. The contractor shall himself manage the work and engage Engineers and supervisors as mentioned above in clause D-Inspection of works, these are all time resident Engineers on the work capable of managing and guiding the work and understanding the specifications and contract condition. The Contractor’s authorised engineers, supervisors will be responsible for taking the instructions from Architect-PMC/BPCL and carrying them out. This engineers and supervisors shall not be changed without prior permission from Architect-PMC/BPCL or their representative from the work site.

2. The contractor shall supply in details of all supervisory and other staff employed by the Contractor to Architect-PMC/BPCL and notify changes made and satisfy the Architect-PMC/BPCL regarding the quality and sufficiency of the staff, thus employed. The Architect-PMC/BPCL will have unquestionable right to ask for changes in the quality and numbers of contractor’s supervisory staff and to order removal from work of any such staff. The contractor shall comply with such orders and effect replacement to the satisfaction of the Architect-PMC/BPCL.

3. A work order book shall be maintained on site and it shall be the property of BPCL and the contractor should promptly sign orders given there in by The Architect-PMC/BPCL or his representative and comply with them. The Contractor shall report the compliance in good time so that it can be checked by Architect-PMC/BPCL or their representative. The Contractor at his own cost provide the blank work order book with machine numbered pages as approved by Architect-PMC/BPCL for this purpose. The work order books have triplicate pages. Original pages will be retained by the Bharat Petroleum Corporation Ltd.

F. SAMPLES AND TESTING OF MATERIALS:-

1. All materials to be used on work shall be got approved in advance from the Architect-PMC/BPCL and shall pass the test and/or analysis required by them, which will be,
   a. As specified in the specification for the items concerned and /or
   b. I.S.specifications (whichever and wherever applicable) or
   c. Such recognized specifications acceptable to Architect-PMC/BPCL as equivalent there to or In absence of such authorized specification,
   d. Such requirement test and/or analysis as may be specified by the Architect-PMC/BPCL in order of precedence given above

2. The contractor shall at his risk and costs make all arrangements and /or shall provide all such facilities as the Architect-PMC/BPCL may require for collecting, preparing required number of samples for test or analysis at such time and to such places as may be directed by Architect-
3. The contractor shall if and when required submit at his cost the samples of materials to be tested or analyzed and if, so directed, shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and the materials, finally accepted by the Architect-PMC/BPCL.

4. The contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measure required to be taken on account of and as a result of testing of the materials.

5. The contractor or his authorized representative will be allowed to remain present in approved laboratory while testing samples furnished by him. However, the results of all the tests carried out in the approved laboratory in the presence or absence of the contractor or his authorized representative will be binding on the contractor.

6. The contractor shall at his own cost set up laboratory at site to carry out the routine tests of materials, which are to be used on the work. The tests will have to be carried out either in his field laboratory or in an approved laboratory. In case tests are carried out in field Laboratory, then at least 30% tests or frequency as required by Architect-PMC/BPCL should be carried out in nearest laboratory approved by Architect-PMC/BPCL.

7. Design of concrete will have to be obtained from laboratory approved by Architect-PMC/BPCL. The cement consumption for controlled concrete will be as per mix design of concrete as approved by Architect-PMC/BPCL.

G. CO-ORDINATION:-

1. When several agencies for different sub-works on the project are to work simultaneously on the project, contractor should do full co-ordination and co-operation between different agencies to ensure timely completion of the whole project smoothly. The schedule dates for completion specified in contract shall therefore, be strictly adhered to. Each agency may make his independent arrangement for water, power, housing etc., if they so desire. On the other hand, the agencies are at liberty to make mutual agreement in this behalf and make joint arrangement with the approval of the Architect-PMC/BPCL. No single agency shall take any steps or action that may cause disruption, discontent or disturbance of work, labour or arrangement etc., in the project location. Any action by any agency of contractor, which the Architect-PMC/BPCL in his unquestioned discretion may consider as infringement of the above code would be considered, as a breach of the contract conditions and contractor shall be dealt with such terms of contract.

2. In case of any dispute, disagreements between the agencies, Contractor should coordinate and manage such issues. If contractor fails to manage his agencies, then Architect-PMC/BPCL shall remove all or any of such agencies working on site and contractor should follow the instructions of Architect-PMC/BPCL in this regards. Architect-PMC/BPCL’s decision shall be final and binding on the contractor and such a decision or decisions shall not vitiate any contract nor absolve the contractor of his/their obligations under the contract nor consider for the grant for any claim of compensation.

H. RELATION WITH PUBLIC AUTHORITIES:-
The contractor shall comply with all rules, regulations, by-laws and directions given from time to time by any local or public Authority in connection with this work and shall himself pay fees or changes which are levied on him without any extra cost to the BPCL.

I. LINING OUT:-

The contractor shall provide free of charge all labour, instrument and material required for lining out, surveying, inspection and give mark out as decided by the Architect-PMC/BPCL and as considered necessary for the proper and systematic execution of the work. The checking or inspection of any setting out of any line or level or work by Architect-PMC/BPCL or his representative shall not in any way relieve the contractor of his responsibility for correctness there of. The contractor shall carefully protect and preserve all benchmarks, site rails, pegs and stones etc. used in setting out the work. Contractor may be required to redo or adjust the line of master layout & or of individual buildings any no of times till the Architect-PMC/BPCL is convinced about all bench marks in regard to correctness.

J. INITIAL MEASUREMENT OF WORK:-

It is necessary to have an initial set of levels or other measurements taken, the same as recorded in the authorized field book or measurement book of BPCL by the PMC Engineers and authorized representative of contractor under the observation of BPCL for proper measurement of the work. It will be signed by the contractor, PMC and BPCL, Contractor will be entitled to have a true copy of the same made at his cost.

Any failure on the part of the contractor to get such levels etc., recorded before starting the work will render him liable to accept the decision of the Architect-PMC/BPCL or their representatives as to the basis of taking measurement. Likewise the contractor will not cover any work, which will render its subsequent measurements difficult or impossible without first getting the same jointly measured by himself and the authorized representative of the Architect-PMC/BPCL. The record of such measurement on the BPCL side will be signed by the Architect-PMC/BPCL and contractor will be entitled to have true copy of the same made at his cost.

K. PAYMENTS:-

1. The contractor must understand clearly that the rates/offer quoted are for completed work and include all cost due to materials, labour, scaffolding, plant, machinery, supervision, power, octroi all duties, taxes etc. and should also include all expenses to cover the cost of night work if and when required and no claim for additional payment beyond the prices or rates quoted will be entertained.

2. The mode of measurements has been indicated in specification. However, if there is any ambiguity or doubts in its respect, the decision of Architect-PMC/BPCL will be final. Payment will be made against contractors R.A bills as per the schedule of payment given in this tender document as percentage of total payable amount based on schedule of rates on achieving the specified milestones and due certification by Architect-PMC/BPCL.

L. RUNNING ACCOUNT BILL:-

1. One/Two payment in a month will be granted by the Architect-PMC/BPCL, if the progress is satisfactory. Contractor should submit bills to the Architect-PMC/BPCL in triplicate and in
appropriate forms along with all necessary statements & measurements as demanded time to
time, provided always that no single bill shall be less than of Rs.25 lakhs except final bill.

2. Architect-PMC/BPCL and contractor Staff will take initial Ground levels and final levels jointly. The
contractor shall supply required labour and equipments etc. for taking joint measurements.

3. Contractor shall print copies of the measurements and bills in the required format prescribed by
Architect-PMC/BPCL and shall submit bills at his own cost and responsibility by attending the
BPCL office and PMC office.

4. Contractor in confirmation with Architect-PMC/BPCL will record the measurements / payment
schedule in measurement book supplied by Bharat Petroleum Corporation Ltd, Mumbai with
certification about quality and quantity of work. Contractor will have to sign bill and M.B. at
appropriate place.

5. Running Account bills payments shall be made as per payment schedule based on site progress
and financial weight-age assigned to the particular items given in the tender. Built up area
dimensions of building shall be measured excluding external plaster thickness. Contractor is
supposed to construct the buildings as per dimensions given in the drawing. Hence for billing
purpose areas given in the tender only shall be followed. But the contractor is required to prove
his dimensional correctness to the satisfaction of the Architect-PMC/BPCL as & when required.

M. FINAL BILL:-

1. The Contractor should submit final bill within one month after completion/ handing over of the
work and the same will be paid as soon as Possible, if it is found in order. Final payment shall
be made on actual executed quantities (actual constructed built up areas and considering all
excess and savings) after satisfactory completion and due certification by Architect-
PMC/BPCL. Disputed item and claims if any shall be paid along with final bill. In any case,
BPCL as an Owner reserves the complete right to release the final payment to the contractor
on satisfactory completion of all works and documents.

2. The contractor shall also submit five sets of all legal/statutory documents, Warranties,
Guarantees and a CD of all these documents along with final bill.

N. TESTING & REJECTION OF WORK:-

If it is found necessary to Architect-PMC/BPCL from safety/quality point of view to test any part
of the structure, the test shall be carried out by the Contractor at his own cost.

Defective work is liable to be rejected at any stage. The Contractor on no account can refuse to
rectify the defects merely on reasons that further work has been carried out. No extra payment
shall be made for rectification.

O. DRAWINGS:-

The details shown in tendered drawing and all other information pertaining to the site and works
be treated as indicative only and are liable to variation as found necessary while preparing,
working drawings which will be supplied by the Architect-PMC/BPCL during execution, if
necessary. No claim whatsoever shall be admissible on account of minor variation; Architect-
PMC/BPCL’s decision in this regard shall be final & binding on contractor. Maximum 3 sets of all
working drawings will be issued to the contractor free of cost. Additional copies later on will be
issued, if required, at extra cost.

P. ENVIRONMENT, HEALTH AND SAFETY:-

1. Contractor shall be fully responsible for planning and implementing EHS requirements. Contractor
as a minimum requirement shall designate / deploy, minimum One safety supervisor/Officer who
shall look after and responsible for safety at site.

2. The Contractor shall ensure that the Environment, Health & Safety (EHS) requirements are clearly
understood & faithfully implemented at all levels at site.

3. The Contractor shall promote and develop consciousness for Safety, Health and Environment
among all personnel working for the Contractor. Regular awareness, program site meetings shall
be arranged on EHS activities to cover hazards involved in various operations during construction.

4. Arrange suitable first aid measures such as First Aid Box, trained personnel to give First Aid,
install fire protection measures such as adequate number of steel buckets with sand and
adequate fire extinguishers to the satisfaction of Architect-PMC/BPCL.

5. Only properly designed steel scaffolding to be used for working at heights more than 3.0M

6. The Contractor shall provide safe means of access to any working place including provisions of
suitable and sufficient scaffolding at various stages during all operations of the work for the safety
of his workmen, employee and Architect-PMC/BPCL. Contractor shall ensure deployment of
appropriate equipment and appliances for adequate safety and health of the workmen and
protection of surrounding areas.

7. The Contractor shall ensure that all their staff and workers including their sub-contractor(s) shall
wear Safety Helmet and Safety shoes. Contractor shall also ensure use of safety belt, protective
goggles, gloves etc. by the personnel as per job requirements. All these gadgets shall conform to
relevant IS specifications or equivalent.

8. Contractor shall ensure that a proper Safety Net System shall be used at appropriate locations.
The safety net shall be located not more than 30 feet (9.0 meters) or as specified by BPCL/PMC
below the working surface at site to arrest or to reduce the consequences of a possible fall of
persons working at different heights.

9. In the event of an accident involving serious injuries or damages to human life or death of any of
his employees and or labours the same shall be reported within twenty-four hours of the
occurrence to the Engineer and the commissioner of workmen’s compensation.

10. In case of fatal accident or serious non-fatal accidents, contractor will have to pay compensation
to injured worker/dependents of deceased workers as decided by Commissioner Workmen
Compensation act. The amount of compensation likely to be payable will be kept under deposit by
withholding that amount from running bills payable to contractor till the final running bills payable
to Contractor till the final decision is received from commissioner.
11. Adequate and suitable lighting at every work place and approach there to, shall be provided by the Contractor before starting the actual works.

12. Hazardous and/or toxic materials such as solvent coating, or thinners shall be stored in appropriate containers.

13. Contractor shall ensure that a house keeping of site is continuously maintained. All surplus earth and debris, unused/surplus Cables, Steel items, steel scrap, all wooden scrap, empty wooden cable drums and other combustible packing materials etc. lying scattered at different places within the working areas are removed and disposed off or shall be storage temporarily in identified location and the disposed off from site. Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.

14. Roads/access areas shall be kept clear and materials like: pipes, steel, boulders, concrete, chips and bricks etc. shall not be allowed on the roads to obstruct free movement of men & machineries. Water logging on roads shall not be allowed.

15. Suitable facilities for toilet, drinking water, proper lighting shall be provided at site commensurate with applicable Laws and as per GRIHA requirements.

16. Since the work is to be carried in a residential area, all the work will have to be necessarily carried out with minimum of disturbances to the normal functioning of the activities in any way. The Contractor may have, therefore, has to adjust his working hours. Despite all this, if some disturbance is inevitable due to the very nature of any particular item of work, the contractor shall give intimation to the Architect-PMC/BPCL Site Engineer to enable them to organize his matters suitably.

17. Since work will have to be carried out at all heights and in all seasons, abundant care and precautions will have to be taken by the contractor to prevent any falling objects from top endangering persons and objects below. The contractor will have to provide working platforms in the corridor’s while working. Necessary safety nets, barricading, etc are also to be provided.

18. In general, the work shall be carried out in a manner as not to adversely affect neighboring structures and activities should be carried out with minimum disturbance, noise, dust, vibrations, shocks etc. While working during odd hours, care has to be taken to see that occupants of neighboring buildings are not put to any inconvenience due to noise, bright light etc.
TECHNICAL BRIEF OF WORK

1. All civil works shall be carried out as per design/drawings standardized by the Architect and Consultants and the specification provided by them. All standard drawings are enclosed with the tender documents. In case any item is not covered under specification then the same shall be carried out as per CPWD specification and applicable Standards and Codes. Any item for which specification is not provided herein and is not covered under CPWD specification shall be executed as per manufacturer guidelines. All materials shall be of best quality conforming to relevant Indian Standards and Codes. In case of any conflict between Standards/Code and Technical Specification, the provisions of Technical Specification shall prevail, and the Architect-PMC/BPCL decision on interpretation shall be final.

2. The entire land within the layout should be properly developed as per approved drawings and specification & as directed by Architect-PMC/BPCL. The Contractor shall furnish all labor, tools, equipment, materials, temporary works, constructional plant and machinery, fuel supply, transportation and all other incidental items not shown or specified but as may be required for complete performance of the Works in accordance with drawings, specifications and direction of Architect-PMC/BPCL.

3. Contractor shall carry out necessary investigation and surveys to develop intimate knowledge of the site condition, availability, approaches to the sites etc. This shall also include taking of trial pits and trial bores, testing of soils, obtaining test results from approved govt. laboratory etc. if required for foundation conditions. The Contractor shall contact the various local authorities and obtain all the necessary relevant information.

4. Comply to all Green Building Conditions of GRIHA during construction. Specification of material strictly to adhere to GRIHA Conditions. Submission of Photos and documents to support the same to be maintained and submitted on regular basis.

5. Construction works to be executed as per the technical details, detailed specifications & drawings. Addition or omission of any technical details, detailed specification will not change any scope of items to be executed.

6. The specifications of materials and workmanship shall be as per standard specifications of CPWD. For items not included in the standard specifications, the following specifications shall apply in pertinent particulars:-
   
a. Specifications of Bureau of Indian Standards (BIS).
   b. Standard specification of CPWD

7. The samples of each class of materials shall be got approved prior to actual use. Satisfactory tests for the materials shall be given by the Contractor(s) at his own cost as directed by Architect-PMC/BPCL. The materials shall be got tested from Government Laboratory/any other approved laboratory, as directed and same as per prescribed norms, i.e. I.S. Architect-PMC/BPCL is empowered to reject or approve materials based on test report and no doubts and disputes shall be entertained. All samples of material shall be supplied by the Contractor(s) at his own cost as per the supply thereof is clearly intended by or provided for the Contract. The
cost of making any test shall be borne by the Contractor(s) as and when required as to ascertain quality of work executed/ to be executed.

8. All materials and workmanship shall be of the respective kinds described in the contract and in accordance with the Architect-PMC/BPCL instructions and shall be subjected from time to time to such tests as the Architect-PMC/BPCL may direct at the place of manufacture of fabrication, or on the site or at such other place or places as may be specified in the contract, or at all or any of such places. The Contractor(s) shall provide at his own cost such assistance, instruments, machines, labour and materials as per normally required for examining, measuring and testing of work and the quality, weight or quantity of any material used and shall supply samples of materials before incorporation in the works for testing as may be selected and required any by the Architect-PMC/BPCL.

9. Water Supply distribution network within the plot including Underground tank (UG), Overhead tank(OH), piping works, water meters, valves, etc. should be constructed as per tender documents & drawings and should meet the local authorities norms. Inlet water supply line to the plot shall be provided by BPCL. However, connections to this line including fittings, fixing, labour charges should be borne by the contractor. Sewage disposal system to be constructed as per tender documents & drawings and should meet the local authorities norms. Main Sewage line of staff colony is passing from south side of plot. Contractor should connect the main sewage line of the building to this line including all materials and labour required at his own cost.

10. BPCL shall provide the main cable of power supply from substation to the location of feeder pillar of building. The connections, terminations of main cable to feeder pillar should be done by contractor including material and labour at his own cost.

11. Staircase / lift well will not be allowed for transport of materials except of minor nature and contractor will have to provide mechanical lift or pulley at their own cost. No extra payment will be made for this arrangement.

12. BPCL has appointed Architect-PMC M/s. Vishwas Satodia for supervising the jobs. Contractor shall have to co-ordinate with the Architects, structural consultant or their representative and all other consultants appointed by M/s. Vishwas Satodia for above work. Contractor shall follow the instruction given by them as if it has been given by BPCL till such authority has been given by BPCL to them, whenever and wherever necessary for the smooth / speedy and quality execution of the work in the best possible manner.

13. Average depth of excavation for foundation as per Geotechnical investigation report is 7 meter with respect to average natural ground level of particular plot. If the average depth exceeds than the mentioned depth from average natural ground level, then excess quantities involved such as excavation, R.C.C., concrete etc. will not be paid to the contractor.

14. If required, soil in foundation and plinth filling shall be treated so as not to undergo volume changes due to consolidation or due to proximity of ground water and surface water. The partition walls shall rest on beams, even in case of ground floor in building with frame structure.

15. Any kind of debris material or excess quantity of excavated materials shall be conveyance to any lead including outside staff colony by contractor as directed by Architect-PMC/BPCL. No claim or extra item will be sanctioned or paid to contractor against these works.
16. Concrete for all structural works in general shall be Ready Mix Concrete (RMC) of design mix approved by structural consultant. RMC with fly ash content, slag content as prescribed by RCC Consultant shall only be used for concreting. Minor structural members such as staircase pardi, lofts etc. shall be allowed to be constructed in cast in situ concrete with approved design mix of consultant. However, if quantity of concrete required for such items is more than 3 cum at a single point of time, then Ready Mix Concrete (RMC) should be used.

17. Aerated Concrete Block work shall not come in contact with foundation soil. Aerated Concrete Block work shall be protected by suitable plaster with mesh for external plaster.

18. River sand shall be washed using electrically operated sand washing machine, before use. However, if quality of river sand is not good or shall not available due to scarcity due to ban in Mumbai on quarrying by the state government then in such cases contractor should arrange to get the properly sieved sand from Gujrat /other districts in bags or Manufactured Sand shall be arranged to use on site. Testing of the sand through approved laboratory shall be arranged by contractor. On testing and on approval of RCC Consultant/Architect-PMC/BPCL such sand shall be used at site. Work should not stop for the scarcity or non availability of sand.

19. The external wall and plinth protection and concrete paving in layout shall be so constructed as to prevent entry of rodent into the building. Average 10 cm thick concrete of M-20 shall be used for the same with chemical compounds as mentioned the technical details.

20. Joints in concrete shall be properly cleaned and applied with epoxy or equivalent synthetic bonding coat as approved by consultant.

21. The slabs of building, external walls, baths, sinks, top slab of staircase cabins, overhead water tanks etc. of all floors must be thoroughly leak proof. Specialized waterproofing treatment as mentioned in the tender shall be applied through specialized waterproofing agency as approved by Architect-PMC/BPCL. The Contractor shall give 10 year's bank guarantee for water proofing equivalent to amount of Rs. 15,00,000.00 (Rupees Fifteen Lakhs) valid for Ten years from the date of completion of the whole project. In case of leakage/dampness, the contractor will not only repair the leakage/dampness but also replace the flooring/dado tiles, w.c. pan, plumbing and sanitary fittings etc. and bring the structure to its original condition as after completion of work. Contractor shall provide Manufacturers Warranty for the complete waterproofing works.

22. In case of leakage / dampness is observed within 10 years from the date of completion of whole work, a written notice will be given to the contractor. The contractor shall immediately start the repair work and complete the same to satisfaction of the BPCL within 30 days of the issue of the said notice. If the contractor fails to do so then the Bank Guarantee as above will be encashed by Bharat Petroleum Corporation Ltd for rectifying the work. However no refund will be payable to the contractor, even if the cost incurred on rectification is less than Rs.15,00,000.00

23. All sanitary and water fittings and pipes etc. shall be tested and their size and pattern shall confirm to the latest Municipal Bye-laws. This part of the work shall be carried out through a licensed plumber according to latest standard practice as per specification

24. Under the pressure test no leak or sweating shall be visible at all section of pipes, fittings, valves, Hydrants & welded joints. Any defective workmanship and defective pipes, fittings,
valves or Hydrants discovered in consequence of this pressure test shall be removed and replaced with acceptable material & the test shall be repeated until found satisfactory by the Architect-PMC/BPCL.

**DOCUMENTS TO BE MAINTAINED AT SITE**

1. Hindrance register
2. Daily work progress register
4. Stage passing register.
5. Site Instruction Note
6. Level Book
7. Foundation passing register.
8. Anti-termite treatments register.
11. Cement consumption register.
12. Steel testing register and file.
13. Steel consumption register.
14. Concrete cube testing register and file.
15. Brick, timber and tiles testing register and file.
17. Block work Register
18. Plastering work register
19. Silt content register
20. Register for waterproofing.
22. Register of test if required.
23. Deviations register.
25. All material test reports from recognized laboratories as per format approved by BPCL / Architect
26. Photographs and all documents as per GRIHA standards.
27. Attendance register & file of bio-data.
29. Register of wages cum muster roll.
30. Register for visitors & file of their inspection
31. ADHOC Reports as and when required
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description of Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>Foundation</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Excavation for Foundation</td>
<td>Average depth of foundation 7 meter and up to foundation strata having soil bearing capacity 80T/Sq.m.</td>
</tr>
<tr>
<td>2</td>
<td>Soling</td>
<td>230 mm Thick Rubble Soling</td>
</tr>
<tr>
<td>3</td>
<td>Plain Cement Concrete (PCC) below footings</td>
<td>M-20</td>
</tr>
<tr>
<td>4</td>
<td>RCC Footings</td>
<td>M-40</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td><strong>Ground/Plinth</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Filling in Plinth</td>
<td>Murum with Rock Boulders of size less than 200mm with contractor’s material or if available on site of work and as per recommendation of consultant</td>
</tr>
<tr>
<td>2</td>
<td>Car Park in plinth</td>
<td>200 mm above made up road Level and as specified in drawing.</td>
</tr>
<tr>
<td>3</td>
<td>Plain Cement Concrete Bedding</td>
<td>M-20</td>
</tr>
<tr>
<td>4</td>
<td>Flooring at Ground floor excluding entrance foyer</td>
<td>20 mm thick Concrete lacquered interlocking tiles</td>
</tr>
<tr>
<td>5</td>
<td>Flooring at Ground floor entrance foyer</td>
<td>Italian Marble</td>
</tr>
<tr>
<td>6</td>
<td>Staircase-Ground to first floor landings &amp; steps</td>
<td>Granite/Italian marble as per drawing</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td><strong>RCC Superstructure</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>RCC Columns</td>
<td>M-45/ M-40</td>
</tr>
<tr>
<td>2</td>
<td>RCC Beams &amp; Lintels</td>
<td>M-40</td>
</tr>
<tr>
<td>3</td>
<td>RCC Slabs</td>
<td>M-40</td>
</tr>
<tr>
<td>4</td>
<td>RCC Chajja</td>
<td>M-40</td>
</tr>
<tr>
<td>5</td>
<td>RCC Pardi</td>
<td>M-40</td>
</tr>
<tr>
<td>6</td>
<td>RCC Staircase</td>
<td>M-40</td>
</tr>
<tr>
<td>7</td>
<td>Reinforcements</td>
<td>Thermo Mechanically Treated (TMT) FE 500</td>
</tr>
<tr>
<td>8</td>
<td>Cover for RCC Members</td>
<td>Concrete Cover Blocks of required thickness</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td><strong>Blockwork</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>External Walls</td>
<td>AAC Blocks 230mm Thick in C.M. 1:4</td>
</tr>
<tr>
<td>2</td>
<td>Internal Walls</td>
<td>AAC Blocks 150 mm Thick in C.M. 1:4</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td><strong>Plaster</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Internal Ceiling</td>
<td>Gypsum Plaster 6mm Thick</td>
</tr>
<tr>
<td>2</td>
<td>Internal Wall Plaster</td>
<td>Cement Plaster 6 mm Thick in C.M. 1:4 (First Coat) + Gypsum Plaster 6mm Thick (2nd Coat)</td>
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</tr>
<tr>
<td>3</td>
<td>External Plaster</td>
<td>Sand faced Plaster 23mm thick in two coats, base coat 15 mm thick in 1:4 C.M. and sand face treatment 8 mm thick with 1 kg or as specified by manufacturers per cement bag water proofing compound and polypropylene/recron fibres for crack resistance.</td>
</tr>
<tr>
<td><strong>F</strong> Flooring/dado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Staircase landings</td>
<td>25mm thick Kota Stone as per drawing</td>
</tr>
<tr>
<td>2</td>
<td>All Treads &amp; Risers of Staircase</td>
<td>1 pc Kota Stone 25 mm thick as per drawing</td>
</tr>
<tr>
<td>3</td>
<td>All floor Lobby, All Rooms, Lift cladding except Ground floor</td>
<td>Vitrified tiles (800X800) 8 mm to 10 mm thick</td>
</tr>
<tr>
<td>4</td>
<td>All Toilets floor tiles</td>
<td>Antiskid Coloured Ceramic tile (300X300) 6 to 8 mm thick or size as per approved</td>
</tr>
<tr>
<td>5</td>
<td>All Kitchen, balconies floor tiles</td>
<td>Antiskid Coloured Ceramic tile (800X800) 6 to 8 mm thick or size as approved</td>
</tr>
<tr>
<td>6</td>
<td>Skirting</td>
<td>Similar to immediate flooring-100 mm height</td>
</tr>
<tr>
<td>7</td>
<td>Dado in Kitchen &amp; Toilet</td>
<td>600x300 mm color Ceramic tile dado up to ceiling height and as per drawing</td>
</tr>
<tr>
<td>8</td>
<td>Kitchen Platform</td>
<td>15 to 18 mm thick Jet Black/ required colour Granite Top over 25 to 30 mm thick kadappa base platform with SS sink (Nirali Make) as per drawing</td>
</tr>
<tr>
<td>9</td>
<td>Dada below kitchen platform</td>
<td>White Glazed tiles 300 x 300, 6 mm thick</td>
</tr>
<tr>
<td>10</td>
<td>Area Development</td>
<td>60mm thick paver blocks</td>
</tr>
<tr>
<td><strong>G</strong> Doors, windows and cupboards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Window Sills/Jams-all four sides</td>
<td>Sandwich Black/ required colour Granite 15 to 18 mm thick with 5 cm over lap</td>
</tr>
<tr>
<td>2</td>
<td>Door Frames -3 Sides</td>
<td>CP Teak/BTC wood frames as approved</td>
</tr>
<tr>
<td>3</td>
<td>Sliding Window</td>
<td>Aluminum heavy section glossy black coloured Anodised 3 &amp; 5 track with 2 no of SS mosquito nets or as per drawing wt 6mm thick glass as per GRIHA</td>
</tr>
<tr>
<td>4</td>
<td>Main Entrance Door of flat and Building Staircase (FRD)</td>
<td>45 mm thick solid core external water proof flush door with 1 mm thick laminate finished on both side using all material approved as per GRIHA &amp; CFO</td>
</tr>
<tr>
<td>5</td>
<td>Internal Doors</td>
<td>35 mm thick solid core external water proof flush door with 1 mm thick laminate finished on both side using all material approved as per GRIHA &amp; CFO</td>
</tr>
<tr>
<td>6</td>
<td>Toilet &amp; duct doors</td>
<td>35mm thick FRP door</td>
</tr>
<tr>
<td>7</td>
<td>All Hardware</td>
<td>Brass/SS as approved</td>
</tr>
<tr>
<td>8</td>
<td>Window grill for all windows of all bedrooms, halls, dinning, balconies</td>
<td>Approx 20 kg per sq mt as per design using MS square/flat bar</td>
</tr>
<tr>
<td></td>
<td>Internal Painting</td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td>---------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Ceilings</td>
<td>Distemper paint</td>
</tr>
<tr>
<td>2</td>
<td>Walls</td>
<td>Distemper paint</td>
</tr>
<tr>
<td>3</td>
<td>External painting</td>
<td>Waterproof exterior Paint</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Plumbing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Internal Plumbing pipes</td>
<td>All CPVC Pipes various dia. as per drawings</td>
</tr>
<tr>
<td>2</td>
<td>External Plumbing pipes</td>
<td>CI pipes various dia. as per drawings</td>
</tr>
<tr>
<td>3</td>
<td>European (wall mounted) and Anglo Indian (Floor mounted) type W.C.</td>
<td>White glazed with Dual Flushing Valve as per drawing</td>
</tr>
<tr>
<td>4</td>
<td>Wash basin</td>
<td>White over Counter in Master Bedroom , All other Rooms under counter fixed in wall brackets</td>
</tr>
<tr>
<td>5</td>
<td>All Taps and Faucets in Master Bedroom</td>
<td>Jaquar Alive series Collection Chrome finish</td>
</tr>
<tr>
<td>6</td>
<td>All other toilets &amp; Kitchen</td>
<td>Jaquar Fusion series Collection Chrome finish</td>
</tr>
<tr>
<td>7</td>
<td>Nahani traps</td>
<td>SS jali or as per approved</td>
</tr>
<tr>
<td>8</td>
<td>All other fixtures like towel rod , ring,door hook etc</td>
<td>SS finish or as approved</td>
</tr>
<tr>
<td>9</td>
<td>Plumbing Duct/other areas as per drawing</td>
<td>50 mm thick Glass Reinforced Concrete</td>
</tr>
</tbody>
</table>
GENERAL SCOPE FOR GRIHA WORKS

Introduction:

1.1 Ministry of New and Renewable Energy, Govt. of India (MNRE) has developed a comprehensive building rating system called Green Rating for Integrated Habitat Assessment (GRIHA).

1.2 The proposed building envisages incorporation of eco-concepts at all levels. It is an endeavor to achieve best standards as per Green building norms for the proposed building. BPCL intends to acquire a minimum of GRIHA 4- STAR RATING for the proposed project.

1.3 BPCL has registered the proposed project with GRIHA Council; institution authorized by MNRE to process and evaluates the buildings under GRIHA.

1.4 BPCL has engaged consultant for providing Comprehensive services for Architectural, Green building and Project Management Consultancy services, herein further referred as Architect-PMC. Contractor to follow the instruction given by Architect-PMC as if they have been given by BPCL.

1.5 Proposed project is comprehensively designed in association with the Architect-PMC and their Green Building Consultants by suitably incorporating green building requirements to achieve desired Green Building Rating. However, if there are certain items which are not detailed out or mentioned in the tender shall also be required to be executed as per the instructions of BPCL and Architect-PMC in order to get the Green Building rating.

1.6 BPCL along with Architect-PMC and their consultants has incorporated possible GRIHA criteria in the design, specification, BOQ and scope of work. However, the achievement of GRIHA 4 Star rating is possible only upon contractor’s commitment and compliance of relevant GRIHA criteria.

1.7 The bidders shall understand the GRIHA rating system and its evaluation process concept, the scope of their works and assist BPCL in all aspects to achieve the proposed rating. For a more detailed understanding the bidders are advised to refer to the relevant portions of the GRIHA manuals.

1.8 Most of the activities under GRIHA are already included in tender. The specifications for activities are already covered under different sections up to certain extent. However, contractor should evaluate his own requirements for the same and assess his costs to comply with GRIHA requirements.

1.9 Contractor to submit a narrative, supported with Invoices and certificate from manufacturer and test certificate and Photographs for the same for showing the compliance of GRIHA Conditions.
2. Commitment, Compliance & Appraisal of GRIHA Criteria:

The contractor shall commit and comply with the GRIHA guidelines, advice and instructions of the BPCL, Architect-PMC and their Green Building Consultants. Photos to be taken daily and especially to support the following GRIHA conditions and submitted along with narratives. Failure to do so will be considered as non-compliance to GRIHA and result in charging of penalty.

Some of the important GRIHA Criteria’s along with their requirements have been briefly indicated hereunder:-

a) Preserve and protect landscape during construction/compensatory depository forestation:

1. Construction activities to been planned in a way that excavation & construction work, up to plinth level is not coinciding with rainy season and the site disruption is restricted to pre-designated areas.
2. Construction work and erosion control applications to be scheduled and sequenced during dry weather periods when the potential for erosion is the lowest.
3. Measures such as collecting runoff from construction areas and material storage sites; diverting water flow away from such polluted areas, so that pollutants do not mix with storm water runoff undisturbed areas.
4. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to treatment device or facility. The plan shall indicate how the above is accomplished on site, well in advance of the commencing of the construction activity.
5. Topsoil removal and preservation to be compulsorily done. Topsoil shall be stripped to a depth of 200 mm from areas proposed to be occupied by buildings, roads, paved areas and external services. Topsoil is rich in organic content and is essential to establish new vegetation. It shall be stockpiled to a height of 400 mm in designated areas and shall be reapplied to site during plantation of the proposed vegetation. Topsoil shall be separated from subsoil debris and stones larger than 50 mm diameter. The stored topsoil may be used as finished grade for planting areas. If the topsoil is not stored on site, it can be alternatively given to the nursery or for gardening purposes. Documentation of topsoil preservation has to be maintained at site as per the requirement of Architect-PMC/BPCL.
6. Spill prevention and control plans to be made and submitted, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, petroleum products, fertilizers and solvents.
7. Protect & Preserve existing trees if any as per directions of Engineer-in-charge.
8. Slope construction techniques to control erosion to be used when construction during wet season is unavoidable. Sedimentation collection systems, drainage systems and runoff diversion systems shall be installed before construction activity. The Architect-PMC/Engineer-in-charge shall monitor the site conditions and progress of work and schedule appropriate timing and sequencing of construction.
9. Soil erosion to be avoided by maintaining a protective cover on the soil, and creating a barrier to the erosive agent (i.e., wind and water).
10. Stabilize bare soils on the site: by using erosion control mats, seeding / planting.
11. Remove sediment from runoff before it leaves the site: use stabilized construction entrances/exits, silt fences, sediment traps, check dams etc.
12. Plan soil disturbance activities for the dry season.
13. Making Silt fences to hold water, allowing sediment to settle out as an effective sediment control measure.

b) Provide minimum level of sanitation/safety facilities for construction workers:

1. Ensure the health and safety of workers during construction, with effective provisions for the basic facilities such as sanitation and drinking water, and safety PPE/equipment’s for workers, first aid box, etc. at site.
2. Ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard.

c) Reduce Air and Noise pollution during construction:

1. Cover skips and trucks loaded with construction materials and continually damp down with low levels of water.
2. Segregate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.
3. Cover up and protect all drains on site.
4. Collect any wastewater generated from site activities in settlement tanks, screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations.
5. Use low-sulphur diesel oil in all vehicle and equipment engines, and incorporate the latest specifications of particulate filters and catalytic converters. PUC of vehicles to be submitted.
6. No burning of materials on site.
7. Noise pollution to be reduced through careful handling of materials; modern, quiet power tools, equipment and generators; low impact technologies; and wall structures as sound shields.

d) Efficient water use during construction:-

1. The use of potable water during construction to be minimized.
2. Materials such as pre-mixed concrete for preventing loss during mixing or use recycled treated water and control the waste of curing water to be used.
3. Gunny bags to be used for column, plinth beams concrete curing and slabs to be cured by water ponding.

e) Utilization of fly ash in the building structure:

1. Use of low-embodied energy industrial-waste fly ash as the construction material. Use fly ash for RCC (reinforced cement concrete) structures, brickwork, plaster, screed, mortar, block-work, etc. in the building.
f) **Reduce volume, weight, and time of construction by adopting an efficient technology:**

1. Use pre-cast systems, ready-mix concrete, etc.
2. Replace a part of the energy-intensive materials with less energy-intensive materials and/or utilize regionally available materials, which use low-energy/energy-efficient technologies.

**g) Use low-energy material in the interiors:**

1. Out of the total quantity of all interior finishes and products used in each of the categories mentioned below, a minimum of 70% should be low-energy finishes/ materials/ products, which minimize wood as a natural resource or utilize industrial waste by using products in any category as listed.
   1.1 Sub-assembly/internal partitions/false ceiling/in-built furniture
   1.2 Flooring
   1.3 Doors/windows and frames
2. Before ordering materials contractor to ask Green Building Certificate from manufacturer or dealer and submit the same to Architect-PMC and BPCL for approval or While ordering materials following should be considered:-
   2.1 Purchasing materials that have a recycled content
   2.2 Ordering paints with low odour and VOC emissions
   2.3 Minimize packaging
   2.4 Ordering in standard sizes to minimize on site cutting and wastage
   2.5 Provide adequate storage that is weatherproof and secure
   2.6 Follow suppliers’ storage instructions
   2.7 Keep harmful chemicals in secure areas
   2.8 Protect lightweight materials from wind
   2.9 Store liquids and sand away from drains and water courses

**h) Water recycle and reuse (including rainwater):**

1. Rainwater storage and recharge system to be implemented at site including ground water recharge where potable municipal water is normally used, to reduce the load on municipal supplies and to improve the groundwater level.

**i) Reduction in waste during construction:**

1. Ensure maximum resource recovery and safe disposal of wastes generated during construction and reduce the burden on landfill.
2. Keep record of the waste generated and take pictures.
3. Designate separate areas for storage of recyclables
4. Submit records tabulating the total waste material generated and the quantities which were diverted from landfills.
5. A minimum of 4% of the total site area should be allocated for storage of the waste. This storage area should be covered and the pollutants from the waste should not affect the surrounding.

j) Efficient waste segregation:

1. Different types of waste to be segregated in different categories of waste sections /areas during construction to promote the segregation of waste.

k) Use of low-VOC (volatile organic compounds) paints/ adhesives / sealants:

1. VOC Limits for Materials
   Please follow the type of material & their VOC Limit as mentioned below:-

   **Paints:-**
   - Non-flat paints - 150 g/L
   - Flat (Mat) paints - 50 g/L
   - Anti-corrosive/ anti-rust paints - 250 g/L
   - Varnish - 350 g/L

   **Adhesives:**
   - Tile adhesives - 65 g/L
   - Wood - 30 g/L

l) Reduce the water use by the building:

1. Flow rates of Water Fixtures:-
   Select water fixtures whose average flow rates / capacities should not exceed the values mentioned below. Baseline Flow Rates / Capacity for Water Fixtures in a Typical Household are:-

   1. Flush fixtures - LPF 6/3
   2. Flow fixtures - LPM 12
      At a flowing water pressure of 3 bar

2. Flow fixtures include faucets, basin mixer, taps, showers, shower mixers. The baseline flows can be demonstrated at flowing water pressure of 3 bar. Flowing water pressure of 3bar does not mean that the water supply in the building is at 3 bar.

3. The building fixtures can operate at lower pressures but to show compliance under this credit, the design flow rates are to be submitted at 3 bar. The average flow rate is a simple arithmetic average of all the respective flush / flow fixtures

m) Minimize ozone – depleting substances:

1. Halon-free fire suppression and fire extinguishing systems to be used to eliminate or control the
release of ozone-depleting substances into the atmosphere wherever applicable.

n) Ensure water quality:

1. Ensure groundwater and municipal water meet the water quality norms as prescribed in the Indian Standards for various applications (Indian Standards for drinking [IS 10500-1991], irrigation applications [IS 11624-1986]. In case the water quality cannot be ensured, provide necessary treatment to raw water for achieving the desired concentration for various applications.

o) Energy efficient lighting:

1. The lighting fixtures installed should meet the required Lighting Power Densities. The selected fixtures shall be approved by the Architect-PMC/BPCL before installation.

2. Ensure that the external lighting sources are 100% on automatic controls and as per the below mentioned specifications:

<table>
<thead>
<tr>
<th>Light Source</th>
<th>Minimum allowable luminous efficiency (lm/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFL (compact florescent lamp )</td>
<td>50</td>
</tr>
<tr>
<td>FL (Fluorescent lamps)</td>
<td>75</td>
</tr>
<tr>
<td>MH (metal halide)</td>
<td>75</td>
</tr>
<tr>
<td>HPSV (high pressure sodium vapor lamp)</td>
<td>90</td>
</tr>
<tr>
<td>LEDs</td>
<td>50</td>
</tr>
</tbody>
</table>

3. The Lighting power densities in internal lighting shall have Minimum allowable values as follows:

<table>
<thead>
<tr>
<th>Space Function</th>
<th>LPD (W/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living rooms/Bedrooms</td>
<td>11.8</td>
</tr>
<tr>
<td>Kitchen Area</td>
<td>12.9</td>
</tr>
<tr>
<td>Dining area</td>
<td>9.7</td>
</tr>
<tr>
<td>Rest Rooms</td>
<td>9.7</td>
</tr>
<tr>
<td>Corridors</td>
<td>5.4</td>
</tr>
<tr>
<td>Staircases</td>
<td>6.5</td>
</tr>
<tr>
<td>Reception Lobby</td>
<td>14</td>
</tr>
<tr>
<td>Parking area lighting</td>
<td>2.2</td>
</tr>
</tbody>
</table>

p) Optimize energy performance of building:
1. Ensure that the glass used for the project has a minimum thickness of 6mm. The glass shall not exceed the U value of 5.5 W/m²K and SC of 0.62. A minimum VLT (Transmittance) of 50% shall be required.

2. Ensure that energy efficient Pumps and motor are installed which would follow efficiency not less than mentioned in IS 12615.

q) Renewable energy:

1. Solar panels of 20 kW or 15% of connected load for Air-conditioning and Interior Area Lighting (whichever is more) shall be installed on the rooftop on a MS erected structure.

2. The Solar PV’s shall be of approved make and as required by Architect-PMC/BPCL. However, the project shall not provide battery storage and the excess energy generated shall be given back to the grid through net-metering/ as decided by Architect-PMC/BPCL.

r) Metering and Monitoring:

1. Ensure that Electrical meters are used to measure energy units purchased from utility and energy generated on site. Energy sub metering should be opted to measure energy consumption of indoor lighting, outdoor lighting, Lifts and common areas, etc

2. Provision of Water meter to be installed at all main supply points to measure total water consumption of building.

3. Documentation, Evaluation & Appraisal:

1. The facilitation with GRIHA Council/Secretariat shall be undertaken by Architect-PMC and their Green Building Consultant on behalf of the BPCL. All necessary cooperation shall be extended to them.

2. The contractor shall submit documents, photographs, narratives, certificates and any documents from statutory authorities, and any other proof in requisite formats, demonstrating compliance to the GRIHA norms both in hard copy and soft copy forms as per requirement and as decided by BPCL Engineer-In-charge/ Architect-PMC and their Green building Consultant.

3. The evaluation team from GRIHA Council/Secretariat or their authorized representative shall be conducting periodic and surprise checks at site for assessing compliance to GRIHA norms. The contractor shall demonstrate compliance through actual site situation, documents, photographs and certificates as per their requirements.

4. The contractor shall take all necessary actions to ensure that there are no adverse remarks on compliance.

5. Upon completion of the building, all documents, photographs, narratives and also certificates if any from statutory authorities shall be submitted for evaluation and appraisal to GRIHA Council/Secretariat, who shall issue provisional rating. This provisional rating shall be ratified finalized upon suitable audit and verification upon occupation of the building.
DETAILED SCOPE OF WORK

EARTH WORK

1. SCOPE

The scope of work covered under this specifications pertains to earthwork in excavation for foundations, trenches, pits and over areas, in all sorts of soils, soft and hard rock, correct to dimensions given in the drawing including shoring, protections of existing underground utilities if any, such as water lines, electric cables etc., dewatering and shoring if necessary, stacking the useful materials as directed within the lead specified, refilling around the foundation and into the plinth with selected useful excavated earth and conveyance, disposing off the surplus earth/materials within specified lead and finishing the surface to proper levels, slopes and camber etc. all operations covered within the intent and purpose of this specification.

2. IS CODES

2.1. The following Indian Standard Codes, unless otherwise specified herein, shall be applicable. In all cases, the latest revision of the codes shall be referred to.

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 783</td>
<td>Code of practice for laying of concrete pipes.</td>
</tr>
<tr>
<td>IS 3764</td>
<td>Excavation work-code of safety.</td>
</tr>
<tr>
<td>IS 4081</td>
<td>Safety code for Blasting and related drilling operation.</td>
</tr>
<tr>
<td>IS 2720</td>
<td>Methods of test for soils</td>
</tr>
</tbody>
</table>

3. GENERAL

3.1 The Contractor shall carry out the survey of the site before excavation and set out properly all lines and establish levels for various works such as earthwork in excavation for grading, foundations, plinth filling, roads, drains, cable trenches, pipelines etc. Such survey shall be carried out by taking accurate cross sections of the area perpendicular to established reference/ grid lines at 5 m. intervals or nearer as directed by the BPCL/Architect-PMC based on ground profile. These shall be checked & recorded.
3.2 The excavation shall be done to correct lines and levels. This shall also include, wherever required, proper shoring to maintain excavations and also the furnishing, erecting and maintaining of substantial barricades around excavated areas and warning lamps, safety tapes at night for ensuring safety.

3.3 The rates quoted shall also include for dumping of excavated materials in as directed by the BPCL/Architect-PMC, within the lead specified and levelling the same so as to provide natural drainage. Rock/soil excavated shall be stacked properly as directed by the BPCL/Architect-PMC.

4. **CLASSIFICATION OF SOILS**

4.1. The earthwork shall be classified under the following categories and measured separately for each category:

4.1.1. **All kind of soils:** Generally any strata, such as sand, gravel, loam, clay, mud, black cotton, murum, shingle, river or nallah bed boulders, siding of roads, paths etc. and hard core, macadam surface of any description (water bound, grouted tarmac etc.), lime concrete and their mixtures which for excavation yields to application of picks, shovels, jumper, sanctifiers, ripper and other manual digging implements.

4.1.2. **Ordinary rock:** Generally any rock which can be excavated by splitting with crow bars or picks and does not require blasting, wedging or similar means for excavation such as lime stone, sand stone, hard laterite, hard conglomerate and un-reinforced cement concrete below ground level. If required light blasting may be resorted to for loosening the materials but this will not in any way entitle the material to be classified as ‘Hard rock’.

4.1.3. **Hard rock:** Generally any rock or boulder for the excavation of which blasting or chiseling, wedging, use of rock hammers and cutters is required such as quartzite, granite, basalt, reinforced cement concrete (reinforcement to be cut through but not separated from concrete) below ground level.

4.2. **Authority for Classification:**

The classification of excavation shall be decided by the BPCL/Architect-PMC and his decision shall be final and binding on the contractor. Merely the use of minor use of explosive in excavation will not be considered as a reason for higher classification unless blasting/chiseling is clearly necessary in the opinion of the Engineer-in-charge.

5. **PROTECTIONS**

5.1. After award of the job, contractor should immediately visit the site and make aware about the
detailed site conditions and Staff Colony. Contractor should mark the site area with the help of Architect. Before start of any work, contractor shall provide suitable barricading with colored G.I. Sheets site of 6m height with MS structural supports nailed/ grouted/bolted as specified by Architect-PMC to secure the site. All management (including watch and ward) of barricades shall be the full responsibility of the contractor. The barricades shall be removed only after completion of the work or part of the work as directed by BPCL. The contractor should quote considering the above and no extra will be paid for barricading.

5.2. Excavation where directed by the Architect-PMC/BPCL shall be securely barricaded and provided with proper caution signs, conspicuously displayed during the day and properly illuminated with red lights and/or written using fluorescent reflective paint as directed by Engineer-in-charge during the night to avoid accident. The contractor shall take all precautions to keep all the blinkers working throughout the night for the guidance of the traffic in the following manner. No extra payment will be made for such protection works. The contractors should take this in account while quoting for the tender.

5.3. The Contractor shall take adequate protective measures to see that the excavation operations do not damage the adjoining structures or dislocate the services. Water supply pipes, sluice valve chambers, sewerage pipes, manholes, drainage pipes and chambers, communication cables, power supply cables etc. met within the course of excavation shall be properly supported and adequately protected, so that these services remain functional. However, if any service is damaged during excavation shall be restored in reasonable time without extra cost.

5.4. Any damages done by the contractor to any existing work shall be made good at his own cost. Existing drains pipes, culverts, water supply lines and similar services encountered during the course of execution shall be protected against damage by the contractor at his cost. The contractor shall not store material or otherwise occupy any part of the site in manner likely to hinder the operations of such services.

5.5. Average depth of excavation for foundation is 6.5 - 7 meter with respect to average natural ground level of particular plot. If the average depth exceeds the specified depth from natural ground level, then excess quantities involved such as excavation, backfilling, R.C.C. Concrete works etc. shall not be paid extra to the contractor.

5.6 The noise level shall be maintained within the permissible limit in during the construction activities by the Contractors, as directed by BPCL/Architect-PMC

6. **SITE CLEARANCE**

6.1. Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth up to 30cm measured at a height of one meter above ground level and rubbish removed up to a distance of 10 meters outside the periphery of the area under clearance. The roots of trees and saplings shall be
6.6. Any kind of debris material or excess quantity of excavated material shall be conveyance to any lead by contractor as directed by Architect-PMC/BPCL without any extra cost. Disposal may require to be done outside of staff colony in such a manner as not to draw any objection from the Municipality or other residents etc. No extra payment will be made in this regard.

7. **EXCAVATION IN ALL KINDS OF SOILS**

7.1. All excavation operations manually or by mechanical means shall include excavation and ‘getting out’ the excavated materials. In case of excavation for trenches, water tanks etc. ‘getting out’ shall include throwing the excavated materials at a distance of at least one meter or half the depth of excavation, whichever is more, clear off the edge of excavation. In all other cases ‘getting out’ shall include depositing the excavated materials as specified.

7.2. During the excavation the natural drainage of the area shall be maintained. Excavation shall be done from top to bottom. Undermining or undercutting shall not be done.

7.3. In firm soil since the excavation is deeper than 2 m and in loose, soft or slushy soil, the width of the step shall be suitably increased or the sides slopped or shoring or strutting may
be done as per the instructions of Architect-PMC/BPCL without any extra cost.

7.4. The Contractor to provide for excavation in side slopes keeping in mind the nature of the soil and safety or excavation. Unless otherwise specified, the rates quoted shall also include any conveyance and disposal as specified or directed. Backfilling, as per specification the sides of foundations of columns, footings, structures, walls, tanks, rafts, trenches etc. with excavated material will not be paid for separately. It shall be clearly understood that the rate quoted for excavation including backfilling shall include stacking of excavated material as directed, excavation/ packing of selected stacked material, conveying it to the place of final backfill, compaction etc. as specified. Cost of all operations shall be deemed to have been covered in the rate quoted for excavation.

7.5. Any deficiency found in levels of plot, shall be made good by the contractor by filling/cutting existing ground. If additional quantity of murum is required for filling, contractor shall bring approved quality of murum, from outside at his own cost and it should be compacted as specified.

7.6. In case of excavation for foundation in trenches or over areas, the bed of excavation shall be to the correct level or slope and consolidated by watering and ramming. If the excavation for foundation is done to a depth greater than that shown in the drawings or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with the concrete of the mix used for leveling/ bed concrete for foundations. Soft/ defective spots at the bed of the foundations shall be dug out and filled with concrete without any extra cost as directed by the Engineer-in-Charge.

7.7. While carrying out the excavation for drain work care shall be taken to cut the side and bottom to the required shape, slope and gradient. The surface shall then be properly dressed. If the excavation is done to a depth greater than that shown on the drawing or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with stiff clay puddle at places where the drains are required to be pitched and with ordinary earth, properly watered and rammed, where the drains are not required to be pitched. In case the drain is required is to be pitched, the back filling with clay puddle, if required, shall be done simultaneously as the pitching work proceeds.

7.8. In all other cases where the excavation is taken deeper by the contractor, it shall be brought to the required level by the contractor at his own cost by filling in with earth/murum duly watered, consolidated and rammed.

7.9. In case the excavation is done wider than that shown on the drawings or as required by the Engineer-in-charge, additional filling wherever required on the account shall be done by the contractor at his own cost.

7.10. The excavation shall be done manually or by mechanical means as directed by Architect-
PMC/BPCL considering feasibility, urgency of work, availability of labour /mechanical
equipments and other factors involved. Contractor shall ensure every safety measures for
the workers.

8. EXCAVATION IN ORDINARY/HARD ROCK

8.1. All the excavation operations shall generally be as per clause 7.

8.2. Where hard rock is met (blasting operations are prohibited) chiseling shall be done to
obtain correct levels, slopes, shape and pattern of excavation as per the drawings or as
required by the Architect-PMC/BPCL and no extra cost shall be payable for chiseling. In
ordinary rock excavation shall be carried out by crowbars, pick axes or pneumatic drills and
blasting operation shall not be generally adopted. In rare case, minor blasting can be
permitted as per the approval of Architect-PMC/BPCL.

9. EXCAVATION IN WATER MUD OR FOUL POSITION

9.1 All water that may accumulate in excavations during the progress of the work from
rains, springs, broken water mains or drains and seepage from subsoil aquifer shall be
bailed, pumped out or otherwise removed. The contractor shall take adequate measures for
bailing and/or pumping out water from excavations and/or pumping out water from
excavations and construct diversion channels, bunds, sumps, coffer dams etc. as may be
required. Pumping shall be done directly from the foundation trenches or from a sump
outside the excavation in such a manner as to preclude the possibility of movement of
water through any fresh concrete or masonry and washing away parts of concrete or
mortar. During laying of concrete or masonry and for a period of at least 24 hours or as
mentioned by RCC Consultant thereafter, pumping shall be done from a suitable sump
separated from concrete or masonry by effective means. Capacity and number of
pumps, location at which the pumps are to be installed, pumping hours etc. shall be decided
from time to time in consultation with the Architect-PMC/BPCL. Pumping shall be done in
such a way as not to cause damage to the work or adjoining property by subsidence etc.
Disposal of water shall not cause inconvenience or nuisance in the area or cause damage
to the property and structure nearby.

To prevent slipping of sides, planking and strutting may also be done with the
approval of the Architect-PMC/BPCL. During power failure, DG standby arrangement should
have been done by the contractor for dewatering. While quoting for the rate all these
points shall be included. No extra payment will be made for any reason there off.

10. EARTHWORK FOR FOUNDATION

10.1. Excavation shall be undertaken to the width & depth specified for foundation including
necessary margins for construction operation as per drawing or directed otherwise. Where
the nature of soil or the depth of the trench and season of the year, do not permit vertical
takes, the contractor at his own expense shall put up the necessary shoring, strutting and
planking or cut slopes with or without steps, to a safer angle or both with due regard to the
safety of personnel and works and to the satisfaction of the Architect-PMC/BPCL.

10.2 All the excavation shall be carried out by mechanical excavator unless otherwise
specifically directed.

10.3 The contractor shall make at his own cost all necessary arrangements for maintaining
water level, in the area where works are under execution low enough so as not to cause
any harm to the work shall be considered as inclusive of pumping out or bailing out water, if
required, for which no extra payment shall be made. This will include water coming from any
source, such as rains, accumulated rain water, floods, leakages from sewer and water mains, subsoil water table being high or due to any other cause whatsoever. The contractor
shall make necessary provision of pumping, dredging bailing out water coming from all
above sources and excavation and other works shall be kept free of water by providing
suitable system approved by the Architect-PMC/BPCL.

10.4 Sub-soil water table at work site is reported to be about approx. 5-6 m below the general
ground level as observed in the month of January 2016. The water level is likely to rise up to
1 to 2 m. during rainy season. In order to avoid possibility of water accumulation or area
getting uplifted / damaged due to water pressure, the contractor shall lower the ground
water table below the proposed foundation level by boring tube wells all around the
proposed building using well point sinking method or any suitable method as approved by
Architect-PMC/BPCL. Sub soil water table shall be maintained at least 50 cm. below the
P.C.C. level during laying of P.C.C. including filling of earth/sand. The water table shall not
be allowed to rise above base of raft level until completion of back filling upto ground level
and until the structure attains such height to counter balance the uplift pressure.
However, the contractor should inspect the site and make his own assessment about sub-
soil water level likely to be encountered at the time of execution and quote his rates
accordingly. Rate of all items are inclusive of pumping out or bailing out water, if required.
Nothing extra on this account whatsoever shall be paid to him.

11. EARTHWORK BY MECHANICAL MEANS

Earth work by mechanical means involves careful planning keeping in view site conditions i.e.
type of soil, nature of excavation, distances through which excavated soil is to be transported
and working space available for employing these machines. The earth moving equipment
should be selected accordingly. Scrapers, dozers, graders, dumpers, trucks, trolleys etc. may
be used for mechanised works. Three wheeled 8 to 10 ton power roller or vibratory roller or sheep
foot roller may be used for compaction. Mechanically driven tanker may be used for watering.
The contractor will have to ensure that the watering is done profusely.
12. FILLING AND BACKFILLING

12.1. General
All fill material will be subject to the Architect-PMC/BPCL approval. If any material is rejected by the Architect-PMC/BPCL, the contractor shall remove the same forthwith from the site at no extra cost to the owner. Surplus fill material shall be deposited/ disposed off as directed by the Architect-PMC/BPCL after the fill work is completed. No earth fill shall commence until surface water discharges with as directed by the Engineer-in-charge.

12.2. Material
To the extent available, selected surplus soils from excavated materials shall be used as backfill. Fill material shall be free from clods, salts, sulphates, and organic or other foreign material. All clods of earth shall be broken or removed. Where excavated earth is mostly rock, the boulders shall be broken into pieces not larger than 150mm size, mixed with properly graded fine materials consisting of murum or earth to fill up the voids and mixtures used for filling.

12.3. Fills shall normally be made up of Cohesive Non Swelling (CNS) material and Murum or river sand/gravel, as specified; capable of being compacted up to 95% modified proctor density. If any selected fill material is required to be borrowed from outside, the contractor shall make arrangements for bringing such material from borrow pits at his own cost. The material and source shall be subject to prior approval of the Architect-PMC/BPCL. The approved borrow pit area shall be cleared of all bushes, roots of trees, plants, rubbish etc. Top soil containing salts/ sulphate and other foreign material shall be removed. The materials so removed shall be burnt or disposed off as directed by the Architect-PMC/BPCL. The contractor shall make necessary access roads to borrow areas and maintain the same, if such access road does not exist, at his cost.

12.4. Filling in pits and trenches around foundations of structures, walls etc.
As soon as the work in foundations has been accepted and measured, the spaces around the foundations, structures, pits, trenches etc. shall be cleared of all debris, and filled with earth in layers not exceeding 15 cm., each layer being watered, rammed and properly consolidated, before the succeeding one is laid. Each layer shall be consolidated to the satisfaction of the Architect-PMC/BPCL. Earth shall be rammed with approved mechanical compaction machines. Usually no manual compaction shall be allowed unless the Architect-PMC/BPCL is satisfied that in some cases manual compaction by tampers cannot be avoided. The final backfill surface shall be trimmed and leveled to proper profile as directed by the Architect-PMC/BPCL or indicated on the drawings.

12.5. Plinth filling
Plinth filling shall be carried out with approved material as described herein before in layers not exceeding 15 cm, watered and compacted with mechanical compaction
machines. The Architect-PMC/BPCL may however permit manual compaction by hand tampers in case he is satisfied that mechanical compaction is not possible. When filling reaches the finished level, profused watering shall be done, unless otherwise directed, and allowed to dry and then the surface shall be compacted again as specified above to avoid settlements at a later stage. The finished level of the filling shall be trimmed to the level/slope specified.

12.5.1. Compaction of the plinth fill shall be carried out by means of 10 tonne rollers smooth wheeled, sheep-foot or wobbly wheeled rollers. In case of compaction of granular material such as sands and gravel, vibratory rollers shall be used. A smaller weight roller may be used only if permitted by the Architect-PMC/BPCL. As rolling proceeds water sprinkling shall be done to assist consolidation. Water shall not be sprinkled in case of sandy fill. The thickness of each unconsolidated fill layer can in this case be upto a maximum of 300 mm. The Architect-PMC/BPCL will determine the thickness of the layers in which fill has to be consolidated depending on the fill material and equipment used. Rolling shall commence from the outer edge and progress towards the centre and continue until compaction is to the satisfaction of the Architect-PMC/BPCL, but in no case less than 10 passes of the roller will be accepted for each layer.

The compacted surface shall be properly shaped, trimmed and consolidated to an even and uniform gradient. All soft spots shall be excavated and filled and consolidated. At some locations/areas it may not be possible to use rollers because of space restrictions etc. The Contractor shall then be permitted to use pneumatic tampers, rammers, etc. and ensure proper compaction.

12.6. Sand filling in plinth and other places
At places backfilling shall be carried out with sand if directed by the Architect-PMC/BPCL. The sand used shall be clean, medium grained and free from impurities. The filled-in-sand shall be kept flooded with water for 24 hours to ensure maximum consolidation. Any temporary work required to contain sand under flooded condition shall be to the Contractor's account. The surface of the consolidated sand shall be dressed to required level or slope. Construction of floors or other structures on sand fill shall not be started until the Architect-PMC/BPCL has inspected and approved the fill.

12.7. Filling in trenches
Filling in trenches for pipes and drains shall be commenced as soon as the joints of pipes and drains have been tested and passed. The backfilling material shall be properly consolidated by watering and ramming, taking due care that no damage is caused to the pipes. Where the trenches are excavated in soil, the filling from the bottom of the trench to the level of the centre line of the pipe shall be done by hand compaction with selected approved earth in layers not exceeding 10 cm; backfilling above the level of the centre line of the pipe shall be done with selected earth by hand compaction or other approved means in layers not exceeding 15 cm. In case of excavation of trenches in rock, the filling upto a level of 30cm above the top of pipe shall be done with fill materials, such as earth,
murum etc. The filling up of the level of the centerline of the pipe shall be done by hand compaction in layers not exceeding 10cm. Whereas the filling above the centerline of the pipe shall be done by hand compaction or approved means in layers not exceeding 15cm. The filling from a level of 30cm above the top of the pipe to the top of the trench shall be done by hand or other approved mechanical methods with broken rock filling of size not exceeding 15cm mixed with fine material as available to fill up the voids. Filling of the trenches shall be carried simultaneously on both sides of the pipe to avoid unequal pressure on the pipe.

13. **SITE GRADING**

13.1. Site grading shall be carried out as indicated in the drawings and as directed by the Architect-PMC/BPCL. Excavation shall be carried out as specified in the specification.

13.2. To the extent available, selected surplus soils from excavated materials shall be used as fill. Fill material shall be free from clods, salts, sulphates, and organic or other foreign material. All clods of earth shall be broken or removed. Where excavated material is mostly rock, the boulders shall be broken into pieces not larger than 150mm size, mixed with properly graded fine material consisting of murum, earth to fill up voids and the mixture used for filling.

13.3. Fills shall normally be made up of cohesive non swelling (CNS) capable of being compacted up to 95% modified proctor density. In case earth has to be borrowed from outside the boundary, contractor shall arrange the same with no cost to owner. The contractor shall make necessary access roads to borrow areas and maintain the same, if such access road does not exist, at his cost.

13.4. The fill material shall be tested for its optimum moisture content and maximum dry density as per is: 2720 part –vii & part-viii. Moisture content shall be checked at the source of supply in accordance with is: 2720 part -ii and if found less than that required for proper compaction, the same shall be made good either at the source or after spreading the soil in loose thickness for compaction. In the latter case, water shall be sprinkled directly from the hose line or from the truck mounted water tank making due allowance for evaporation losses and the fill material be thoroughly mixed by means of harrows, rotary mixers or by any other suitable approved method until the layer is uniformly wet. Flooding shall not be permitted for watering purpose under any circumstances. If the material delivered is too wet, it shall then be dried by aeration and exposure to the sun till the moisture content is suitable for compaction. Should circumstances arise, owing to wet weather where the moisture content cannot be reduced to the required amount by the above procedure, the work on compaction shall be suspended. Clods or hard lumps of earth shall be broken to have a maximum size of 150 mm when being placed in the layers before compaction.

13.5. All fill material will be subject to the Architect-PMC/BPCL approval. If any material is rejected...
by the Architect-PMC/BPCL, the contractor shall remove the same forthwith from the site at no extra cost to the BPCL. Surplus fill material shall be deposited/ disposed off as directed by the Architect-PMC/BPCL after the fill work is completed. No earth fill shall commence until surface water discharges or otherwise dealt with as directed by the Architect-PMC/BPCL.

13.6. Before commencement of filling, the contractor shall submit proposal for the methodology to be adopted for compaction. The compaction equipments as approved by the Architect-PMC/BPCL shall only be employed to compact the different type materials encountered during construction. If directed by the Architect-PMC/BPCL, the contractor shall demonstrate the efficiency of the equipment, to be used by carrying out compaction near optimum moisture content during compaction. The methodology shall also specify the frequency of various tests to be conducted on compacted soil to ensure that compaction is carried out at near optimum moisture content.

13.7. After clearing site as per clause 6.0, the original ground shall be compacted by rolling subject to a minimum 6 passes of 8 to 10 tonne roller. Approved fill material shall be spread in layers not exceeding 225mm in layer thickness and compacted to 150mm with approved compaction equipment. Each layer shall be watered and thoroughly compacted with proper moisture content and such equipments as may be required to obtain a minimum of 95% of its maximum dry density as determined by Standard Proctor's Test per IS:2720, part-VII. Addition quantity of water if required shall be added by means of sprinklers.

13.8. All compaction shall be done under controlled condition. The degree of compaction requires shall be as per the stipulation laid down in IS: 4701. Frequencies of sampling and testing including the method for conducting the tests are to be submitted to the Architect-PMC/BPCL for approval. Moisture content of the fill material shall be controlled near optimum moisture content during compaction. All tests for determination and checking of the specified density shall be carried out by a qualified Site Engineer in the presence of Architect-PMC/BPCL. All tests shall be carried out in accordance with relevant is code. Records of all tests shall be forwarded to the Architect-PMC/BPCL before proceeding the next layer of filling.

13.9. To ensure that the fill has been compacted as specified, field and laboratory tests shall be carried out by the contractor at his cost. Field compaction test shall be carried out at different stages of filling and also after the fill to the entire height has been completed.

13.10. Contractor shall submit all the test results to the Architect-PMC/BPCL immediately after completion of the tests. A sample shall be deemed to have passed the test when the dry density of the compacted fill is equal to or more than 95% of its maximum dry density. When field density measurements reveal any soft areas in the fills, further compaction shall be carried out as directed by the Architect-PMC/BPCL.
13.11. The contractor shall protect the earthfill from being washed away by rain or damaged in any other way. Should any slip occur, the contractor shall remove the affected material and make good the slip at his cost.

13.12. The fill shall be carried out to such dimensions and levels as indicated on the drawings after the stipulated compaction. The fill will be considered as incomplete if the desired compaction has not been obtained.

13.13. If so specified, the rock as obtained from excavation may be used for filling and levelling to the indicated grades without further breaking. In such an event, filling shall be done in layers not exceeding 50 cms approximately. After rock filling to the approximate level, indicated above has been carried out, the void in the rocks shall be filled with finer materials such as earth, broken stone, etc. And the area flooded so that the finer materials fill up the voids. Care shall be taken to ensure that the finer fill material does not get washed out. Over the layer so filled, a 100 mm thick mixed layer of broken material and earth shall be laid and consolidation carried out by a 10 tonne roller. No less than twelve passes of the roller shall be accepted before subsequent similar operations are taken up.

14. **FILL DENSITY**

The compaction, only where so called for, in the schedule of quantities/ items shall comply with the specified (standard proctor/ modified proctor) density at moisture content differing not more than 5 percent from the density at optimum moisture content. The contractor shall demonstrate adequately at his cost, by field and laboratory tests that the specified density has been obtained.

15. **MEASUREMENTS**

15.1. The length and breadth of excavation or filling shall be considered from respective construction drawings. If needed, measurement at site shall be taken with a steel tape correct to the nearest cm. The depth of cutting or height of filling shall be measured, correct to 5 mm, by recording levels before the start of the work and after the completion of the work. The cubical contents shall be worked out to the nearest two places of decimal in cubic meters.

15.2. **Recording Measurements for Earth Levelling / Grading Work**

15.2.1. **Level Books:** levelling operations and earthwork, measurements are required to be recorded in level books. The Level Books should be numbered, accounted.

15.2.2. **Preparatory Works:** Before starting the earth work, following steps should be taken:

(a) Original ground levels should be recorded by Architect’s representative in the Level Book in the presence of the contractor or his authorized representative, and should be signed by him and the BPCL representative who records the levels. All the local mounds and depressions should be indicated clearly in the drawing and the field Level Book and should be
checked by the Engineer-In-charge the levelling work is started.
(b) While recording the levels, it should be ensured that the circuit is closed by taking final
levels of the starting point or any other point, the R.L. of which was previously determined.
(c) Plans showing initial levels, location of bench marks and reduced levels, should be prepared
and signed by both the Contractor and Architect-PMC/BPCL and before commencement of the
work.

**ANTI-TERMITE PRE & POST CONSTRUCTION CHEMICAL TREATMENT**

1. **SCOPE**
   1.1. This specification covers the general requirements for Anti-termite Constructional Measures,
chemical treatment of soils for the protection of buildings from attack by subterranean termites,
chemicals to be used with their minimum rates of application and procedure to be followed for
treatment.

2. **PURPOSE**
   2.1. Prevention of the termite from reaching the super-structure of the building and its contents to be
achieved by creating a chemical barrier between the ground, from where the termites come and
other contents of the building which may form food for the termites. This to be achieved by treating
the soil beneath the building and around the foundation with a suitable insecticide. Anti-termite
treatment to be done at the time of construction i.e. pre-constructional chemical treatment or after
the building has been constructed i.e. treatment for existing building.

3. **APPLICABLE CODES AND SPECIFICATIONS**

   The following codes, standards and specifications are made a part of this specification. All
specifications, standards, codes of practices referred to herein shall be the latest edition including all
applicable official amendments and revisions. In case of discrepancy between this specification and
those referred to herein, this specification shall govern:

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:6313 Part I</td>
<td>Code of Practice for Anti-termite Measures in Buildings Constructional Measures</td>
</tr>
<tr>
<td>IS:6313 Part II</td>
<td>Code of Practice for Anti-termite Measures in Buildings- Pre-constructional Chemical Treatment Measures</td>
</tr>
<tr>
<td>IS:6313 Part III</td>
<td>Code of Practice for Anti-termite Measures in Buildings Treatment for Existing Buildings</td>
</tr>
<tr>
<td>IS:632</td>
<td>specification for gamma-bhc ( lindane) emulsifiable concentrates</td>
</tr>
</tbody>
</table>
4. **GENERAL**

**Place of Application**

The Anti-termite treatment shall be provided for pre and post construction activities for foundations, wall trenches, top surface of plinth filling, junction of wall and floor, soil along external periphery of the building and under apron, expansion joints, soil surrounding pipes and conduits, junction of masonry wall and wooden frames of door and window, junction of wooden beam / joist and masonry wall, etc. The Pest control services shall be provided for small size chambers and big size chambers.

4.1. Contractor shall furnish all tools, equipments, qualified supervisory personnel, Labour, materials, any temporary works, consumables, any and everything necessary whether or no such items are specifically stated herein, for completion of the job in accordance with specification requirements.

4.2. Chemicals shall be brought to site of work in sealed original containers. The materials shall be brought in, at a time, in adequate quantity to suffice for the work. The material shall be kept in cool and locked stores. The empties shall not be removed from the work site till the relevant item of work has been completed and permission granted by BPCL/ Architect-PMC.

4.3. Chemicals available in concentration forms with concentration indicated on the sealed containers only shall be used. Chemicals shall be diluted with water/oil/kerosene as specified in required quantity before use, using graduated containers to achieve the desired percentage of concentration. All chemicals to be strictly used as per the specifications and relevant IS Codes.

4.4. No work shall be carried out under unsuitable weather conditions viz. when raining or when the soil is wet due to rain or sub-soil water.

4.5. On final completion of all work, Contractor shall leave the entire premises within the site of his operation clean and free from all rubbish resulting from his operation. Empty containers shall be removed from site and shall be a property of contractor.

4.6. BPCL/Architect-PMC reserves the right to inspect, check and direct any or all operations at any stage of the work and to require unsatisfactory work to be remedied at Contractor's expense.

4.7. Contractor shall take all necessary safety precautions to prevent any adverse effect of chemicals while carrying out the work.

<table>
<thead>
<tr>
<th>IS:4015 Part I</th>
<th>Guide for Handling cases of Pesticide Poisoning First Aid Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:4015 Part II</td>
<td>Symptoms, Diagnosis and Treatment.</td>
</tr>
</tbody>
</table>
4.8. The Chemicals to be used should be environmental friendly and comply with the GRIHA-Green Building Standards.

5. PRE CONSTRUCTIONAL CHEMICAL TREATMENT

5.1. General:-
The item pertains to providing pre-constructional anti termite treatment to building at different stages of construction by applying different appropriate chemicals as per provision in IS:6313 (Part I-II) 1981. The item also covers the treatment to soil.

5.2. Essential Requirements

5.2.1. Hand operated pressure pump with graduated containers shall be used to ensure uniform spraying of the chemical. Continuous check shall be kept to ensure that the specified quantity of chemical is used for the required area during the operation.

5.2.2. Condition of Formation:- The treated soil barrier shall be complete and continuous under the whole of the structure to be protected. All foundations shall be fully surrounded by and in close contact with the barrier of treated soil. Each part of the area treated shall receive the specified dosage of chemical.

5.2.3. Time of Application:- Soil treatment should be started when the foundation trenches and pits are ready to receive mass concrete in foundations. Laying of mass concrete shall start when the chemical emulsion has been absorbed by the soil and the surface is quite dry. Treatment shall not be carried out when it is raining or soil is wet with rain or sub-soil water. The foregoing also applies in the case of treatment to the filled earth surface within the plinth before laying the subgrade for the floor.

5.2.4. Disturbance:- The treated soil barriers shall not be disturbed after they are formed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.

5.3. Material:-

5.3.1. Chemicals:
Following chemical shall be used for preparing water emulsion to achieve the percentage concentration specified against each chemical shall be used for anti-termite treatment.

<table>
<thead>
<tr>
<th>Chemical Standard</th>
<th>Relevant Indian</th>
<th>Concentration by Weight Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Chloropyrifos 20 EC</td>
<td>IS: 8944-1978</td>
<td>1% concentrate</td>
</tr>
<tr>
<td>b. Lindane 20EC</td>
<td>IS:632-1978</td>
<td>1% concentrate</td>
</tr>
</tbody>
</table>
Chemicals are available in concentrated form in the market and concentration is indicated on the sealed containers. To achieve the specified percentage of concentration, chemical should be diluted with water in required quantity before it is used.

Graduated containers shall be used for dilution of chemicals with water in the required proportion to achieve the desired percentage of concentration. For example, to dilute chemical of 20% concentration, 19 parts of water shall be added to one part of chemical for achieving 1% concentration.

5.5. Chemical Treatment:-
4.5.1. Chemical treatment of soils for the protection of buildings from attack of subterranean termites shall be done as per IS: 6313 (Part II)-1981. Treatment shall be got done only from the approved specialized agencies using the chemicals procured from reputed and authorized dealers. Graduated containers shall be used for dilution and spraying of the chemical shall be done using hand operated pressure pumps. Proper check shall be kept to ensure that the specified quantity of chemical is used for the required area during the operation.

5.5.2. Chemical Methods

a) Mound Treatment
Termite mounds within the plinth and contingent apron area shall be destroyed by means of insecticides in the form of water suspension or emulsion which shall be poured into the mounds at several places after breaking open the earthen structure and making holes with crow bars. For a mound volume of about one cum., four Liter of an emulsion in water of 1% Chloropyrifos 20 EC shall be used.

b) Soil Treatment
The chemical (conforming to Indian Standards) as mentioned in 4.3.1 in water emulsion shall be applied uniformly for Treating the soil beneath the building and around the foundations.

5.5.3. Treatment of Foundations pits :-
a) The foundations conditions except RCC foundations shall be followed as per IS Code-6313 (Part-II)

b) For RCC foundations the treatment shall start at the depth of 500 mm below ground level for columns and plinth beams except when such ground level is raised or lowered by filling or cutting after the foundations have been cast. From this depth the back-fill around the columns, beams and R.C.C basement walls shall be treated at the rate of 7.5 Lit./sqm of vertical surface. The other details of treatment shall be as laid down in clause IS Code-6313 (Part-II).

5.4.4. Treatment of Top Surface of Plinth Filling:
The top surface of the filled earth within the plinth walls shall be treated with chemical emulsion at the rate of 5 liters per sq.m of the surface before the sand/sub-grade is laid. Holes up to 50 to 75 mm deep at 150 mm centers both ways shall be made with crow bars on the surface to facilitate saturation of the soil with chemical emulsion.

5.4.5. All above treatments mentioned and Treatment of Junction of Wall and the Floor, Treatment of Soil along External Perimeter of Building, Treatment of Soil under Apron along External Perimeter of Building, Treatment for Expansion Joints, Treatment of Walls Retaining Soil above Floor Level, Treatment of Soil Surrounding Pipes and Conduits should be done as per the procedure mentioned in IS Code-6313 (Part-II).

6. POST CONSTRUCTIONAL CHEMICAL TREATMENT

6.1. **General:-** The item pertains to providing post-constructional anti termite treatment to building as per the requirement by applying different appropriate chemicals as per provision in IS:6313 (Part III) 2001. The item covers inspection of site, preventive measures by appropriate treatments.

6.2. **Material:-**

6.2.1. Chemicals:

Following chemical shall be used for preparing water/Oil/Kerosene emulsion to achieve the percentage concentration specified against each chemical shall be used for anti-termite treatment.

6.3. **Inspection:-**

Before undertaking any type of treatment, a thorough inspection shall be made of the infestation in the building with a view to determine the extent to which it has spread, and the routes of entry of termites into the building.

6.4. **Chemical Treatments:-**

As per the requirement after inspection, chemical treatment around the periphery of the building, Voids in Masonry, sides of the flooring, soil under floors, wooden frames, beams/joists etc. should be done as per the procedure mentioned in IS Code-6313 (Part-III). Pest control services to be provided once for manholes/Inspection chambers to avoid nuisance of cockroaches and other insects.

7. **SAFETY PRECAUTIONS:-**

All chemicals used for anti-termite treatment are POISONS. These chemicals can have an adverse effect upon health when absorbed through the skin, inhaled as vapours or spray mists or swallowed. Care should be taken in the application of chemicals to see that they are not allowed to contaminate tanks/pipelines/water source, which serve as source of drinking water. The person executing job should be provided apron, pair of hand gloves, mask, safety specs etc.
CONCRETE WORK

1. SCOPE

1.1 This specification covers the general requirements for concrete using Ready Mix Concrete (RMC), Cast in-site facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing, transporting, placing, curing, protecting, repairing, finishing and testing of concrete; formwork; requirements in regard to the quality, storage, bending and fixing of reinforcement; as well as mode of measurement.

1.2 It shall be very clearly understood that the specifications given herein are brief and do not cover minute details. However, all works shall have to be carried out in accordance with IS: 456 and other relevant standards and codes of practices or in their absence in accordance with the best accepted current engineering practices or as directed by Architect-PMC / Structural Consultant /BPCL from time to time. The decision of Architect-PMC/Structural Consultant/BPCL as regards the specification to be adopted and their interpretation and the mode of execution of work shall be final and binding on contractor and no claim whatsoever will be entertained on this account.

2. APPLICABLE CODES AND SPECIFICATIONS

2.1 The following specifications, standards and codes, including all official amendments/revisions and other specifications & codes referred to therein, should be considered a part of this specification. In all cases the latest issue/edition/revision shall apply. In case of discrepancy between this specification and those referred to herein below or other specifications forming a part of this document, this specification shall govern.

2.1.1 Materials

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:383</td>
<td>Specification for coarse and fine aggregates from natural sources for concrete.</td>
</tr>
<tr>
<td>IS:455</td>
<td>Specification for portland slag cement</td>
</tr>
<tr>
<td>IS:1489</td>
<td>Specification for Portland pozzolona cement</td>
</tr>
<tr>
<td>IS:1566</td>
<td>Specification for Hard drawn Steel wire fabric for concrete reinforcement</td>
</tr>
<tr>
<td>IS:1786</td>
<td>Specification for high strength deformed steel bars and wires for concrete reinforcement</td>
</tr>
<tr>
<td>IS:2062</td>
<td>Hot Rolled Low, Medium &amp; High Tensile Structural Steel.</td>
</tr>
<tr>
<td>IS:2645</td>
<td>Specification for integral cement water- proofing</td>
</tr>
</tbody>
</table>
2.1.2 **Material Testing and Storage**

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:4031 (Parts 1 to 15)</td>
<td>Methods of physical tests for hydraulic cement</td>
</tr>
<tr>
<td>IS:4032</td>
<td>Method chemical analysis of hydraulic cement</td>
</tr>
<tr>
<td>IS:650</td>
<td>Specification for standard sand for testing of cement</td>
</tr>
<tr>
<td>IS:2430</td>
<td>Methods for sampling of aggregates for concrete</td>
</tr>
<tr>
<td>IS:2386 (Parts 1 to 8)</td>
<td>Methods of test for aggregates for concrete.</td>
</tr>
<tr>
<td>IS:3025</td>
<td>Methods of sampling and test (physical and chemical) water used in industry.</td>
</tr>
<tr>
<td>IS:6925</td>
<td>Methods of test for determination of water soluble chlorides in concrete admixtures.</td>
</tr>
<tr>
<td>IS:4082</td>
<td>Recommendations on stacking and storing of construction materials at site.</td>
</tr>
</tbody>
</table>

2.1.3 **Concrete Mix Design**

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS: 10262</td>
<td>Recommended guidelines for concrete mix design. SP: 23 (S&amp;T) Handbook on Concrete Mixes.</td>
</tr>
<tr>
<td>IS: 4926</td>
<td>Ready Mixed Concrete-Code of Practice</td>
</tr>
</tbody>
</table>

2.1.4 **Concrete Testing**

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:516</td>
<td>Method of test for strength of concrete</td>
</tr>
<tr>
<td>IS:1199</td>
<td>Method of sampling and analysis of concrete</td>
</tr>
<tr>
<td>IS:2770</td>
<td>Methods of testing bond in reinforced concrete</td>
</tr>
<tr>
<td>IS:8142</td>
<td>Method of test for determining setting time of concrete by penetration resistance</td>
</tr>
<tr>
<td>IS:9013</td>
<td>Method of making, curing and determining</td>
</tr>
</tbody>
</table>
### 2.1.5 Equipment

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Description of Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS:1791</td>
<td>Specification for batch type concrete mixers</td>
</tr>
<tr>
<td>IS:2505</td>
<td>General Requirements for concrete vibrators: Immersion type</td>
</tr>
<tr>
<td>IS:2506</td>
<td>General Requirements for screed board concrete vibrators</td>
</tr>
<tr>
<td>IS:2722</td>
<td>Specification for portable swing weigh batchers for concrete (single and double bucket type)</td>
</tr>
<tr>
<td>IS:2750</td>
<td>Specification for steel scaffoldings</td>
</tr>
<tr>
<td>S:4925</td>
<td>Specification for concrete batching and mixing plant</td>
</tr>
<tr>
<td>IS:5892</td>
<td>Specification for concrete transit mixers and agitator</td>
</tr>
<tr>
<td>IS:7242</td>
<td>Specification for concrete spreaders</td>
</tr>
</tbody>
</table>

### 2.1.6 Codes of Practice and Measurement

<table>
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2.1.7 Construction Safety

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3. GENERAL

3.1 Architect-PMC/BPCL shall have the right at all times to inspect all operations including the sources of materials, procurement, layout and storage of materials, RMC Plant and facilities, concrete batching and mixing equipment, and the quality control system. Inspection shall be arranged by contractor for Architect-PMC/BPCL and approval to be obtained, prior to procurement of Concrete from RMC Plant and starting of concrete work. This shall, however, not relieve contractor of any of his responsibilities of procuring quality material. All materials, which do not conform to IS and Tender specifications, shall be rejected.

3.2 Materials should be selected so that it can satisfy the design requirements of strength, serviceability, safety, durability and finish with due regards to the functional requirements and the environmental conditions to which the structure will be subjected. Materials complying with codes/standards shall generally be used.

4. MATERIALS

4.1 Cement

4.1.1 Cement shall be 43 grade / 53 grade Ordinary Portland Cement conforming to IS:8112/IS:12269 or Portland Slag Cement conforming to IS:455 or Portland Pozzolona Cement conforming to IS:1489 or other type of Cement as recommended by Structural Consultant.

4.1.2 The source of supply, type or brand of cement within the same structure or portion thereof shall not be changed without approval from Structural Consultant/Architect-PMC/BPCL.
4.1.3 Cement, which is not used within 90 days from its date of manufacture, shall be tested at a laboratory approved by Architect-PMC/BPCL and until the results of such tests are found satisfactory, it shall not be used in any work.

4.2 **Aggregates**

4.2.1 Aggregates shall consist of naturally occurring stones (crushed or uncrushed), gravel and sand. They shall be chemically inert, strong, hard, clean, durable against weathering, of limited porosity, free from dust/silt/organic impurities/deleterious materials and conform to IS: 383. Aggregates such as slag, crushed over burnt bricks, bloated clay ash, sintered fly ash and tiles shall not be used. Slag if recommended by RCC Consultant to be used after testing and on approval of Architect-PMC/BPCL to be used.

4.2.2 Aggregates shall be washed and screened before use where necessary and as directed by the Architect-PMC/BPCL.

4.2.3 **Coarse Aggregate**

Coarse aggregate for concrete, except as noted above and for other than lightweight concrete shall conform to IS 383. This shall consist of natural or crushed stone and gravel, and shall be clean, and free from elongated, flaky or laminated pieces, adhering coatings, clay lumps, coal residue, clinkers, slag, alkali, mica, organic matter or other deleterious matter.

a. **Screening and Washing**

Natural gravel and crushed rock shall be screened and/or washed for the removal of dirt or dust coating, if so required and as per directed by Architect-PMC/BPCL.

b. **Grading**

Coarse aggregate shall be either in single size or graded. In both cases, the grading shall be within the limits. The size and shape shall be as per relevant IS Code and as directed by Structural Consultant/ Architect-PMC/BPCL. Structural Consultant shall recommend size of coarse aggregate and grading for the Design Mix of M45/M40 Concrete and other concrete to be used for the better strength and/or durability of concrete.

c. **Foreign Material Limitations**

The percentage of deleterious substances in the aggregate delivered for RMC and in-situ concrete shall be limited as per IS Code and recommended by Structural Consultant.
4.2.4 **Fine Aggregate**

Fine aggregate except as noted above, and for other than lightweight concrete shall consist of natural or crushed sand conforming to IS 383. The Sand shall be clean, sharp, hard, strong and durable and shall be free from dust, vegetable substances, adherent coating, clay, alkali, organic matter, mica, salt or other deleterious substances, which can be injurious to the setting qualities/strength/durability of concrete.

a. **Machine-made Sand**

Machine-made sand will be acceptable, provided the constituent rock-gravel composition shall be sound, hard, dense, non-organic, uncoated and durable against weathering on approval of Structural Consultant/ Architect-PMC/BPCL.

b. **Screening and Washing**

River Sand / Machine-made sand shall be prepared for use by such screening or washing, or both, as necessary, to remove all objectionable foreign matter while separating the sand grains to the required size fractions.

c. **Grading**

Unless otherwise directed or approved, the grading of sand shall be within the limits indicated as per relevant IS Code and should be as approved by RCC Consultant.

d. **Fineness Modulus**

The sand shall have a fineness modulus of not less than 2.2 or more than 4.2 and should be as per relevant IS Code approved by RCC Consultant/ Architect-PMC/BPCL.

4.2 **Water**

Water used for both mixing and curing shall conform to IS:456. Potable water is generally satisfactory. Water containing any excess of acid, alkali, oils, organic material, vegetable growth, sugar or salt shall not be used. The tender documents clearly specify that the contractor has to arrange good quality water for construction indicating the source. Water found satisfactory for mixing is also suitable for curing. However, water used for curing shall not produce any objectionable stain or unsightly deposit on the surface. Sea water shall not be used for mixing or curing. Water from each source shall be tested before the commencement of the work and thereafter once in every three months till the completion of the work. In case of ground water, testing shall also be done as per the frequency mentioned above.
4.3 Reinforcement

Reinforcement bars shall conform to IS:2062 or IS:1786 and welded wire fabric to IS:1566 as shown or specified on the drawing. All reinforcement shall be clean, free from pitting, oil, grease, paint, loose mill scales, rust, dirty, dust, or any other substance that will destroy or reduce bond. If permitted by RCC Consultant/Architect-PMC/BPCL, welding of reinforcement shall be done in accordance with IS:2751 or IS:9417 as applicable at no extra cost to the BPCL. Measurement for steel shall be recorded before concreting is commenced and signed by Contractor/Architect-PMC/BPCL. The contractor shall prepare bar bending schedule well in time and have it approved from RCC Consultant/Architect-PMC/BPCL. Steel reinforcement to be fabricated on the basis of the approved schedule.

4.4 Admixtures

Accelerating, retarding, water-reducing and air entraining admixtures shall conform to IS:9103 and integral water proofing admixtures to IS:2645. Admixtures may be used in concrete as per manufacturer's instructions only with the approval of RCC Consultant/Architect-PMC/BPCL based upon the condition that desired slump and strength is obtained with optimum cement content without affecting the durability with the passage of time. An admixture's suitability and effectiveness shall be verified by trial mixes with the other materials used in the works. If two or more admixtures are to be used simultaneously in the same concrete mix, their interaction shall be checked and trial mixes done to ensure their compatibility. There should also be no increase in risk of corrosion of the reinforcement or other embedment's. Calcium chloride shall not be used for accelerating set of the cement for any concrete containing reinforcement or embedded steel parts.

5. SAMPLES AND TESTS

5.1 All materials such as cement, aggregates (coarse & fine), reinforcement and admixtures etc. used for the works shall be tested as per relevant IS codes before use.

5.2 Manufacturer's test certificate shall be furnished, for each batch of cement and samples shall also be got tested by the contractor in a laboratory approved by Architect-PMC/BPCL at no extra cost to BPCL. Sampling and Testing shall be as per relevant IS codes.

5.3 Manufacturer's test certificate shall be furnished, for each batch of steel and samples shall also be got tested by the contractor in a laboratory approved by Architect-PMC/BPCL at no extra cost to BPCL. Sampling and Testing shall be as per relevant IS codes.

5.4 Water to be used shall be tested to comply with requirements of IS:456. Contractor shall furnish manufacturer's test certificates and technical literature for the admixture proposed to be used. If directed by Architect-PMC/BPCL, the admixture shall be got tested at an approved laboratory at no extra cost.
6. STORAGE OF MATERIALS

6.1 All material shall be stored in a manner so as to prevent its deterioration and contamination, which would preclude its use in the works. Requirements of IS:4082 shall be complied with.

6.2 Contractor will have to make his own arrangements for the storage of adequate quantity of cement. If such cement is not stored properly and has deteriorated, the material shall be rejected. Cement bags shall be stored in dry weatherproof shed with a raised floor, well away from the outer walls and insulated from the floor to avoid moisture from ground. Not more than 15 bags shall be stacked in any tier. Storage under tarpaulins shall not be permitted. Each consignment of cement shall be stored separately and consumed in its order of receipt.

6.3 Each size of coarse and fine aggregates shall be stacked separately and shall be protected from leaves and contamination with foreign material. The stacks shall be on hard, clean, free draining bases, draining away from the concrete mixing area.

6.4 Contractor shall make his own arrangements for storing water at site in tanks to prevent contamination.

6.5 The reinforcement shall be stacked on top of timber sleepers to avoid contact with ground/water. Each type and size shall be stacked separately.

7. CONCRETE

7.1 General

Concrete grade shall be as designated on drawings. In concrete grade M20, M40, M45 etc. the number represents the specified characteristics compressive strength of 150 mm cube at 28 days, expressed in N/sq.mm as per IS:456. Concrete in the works shall be "DESIGN MIX CONCRETE" or "NOMINAL MIX CONCRETE". All concrete works of grade M20 or lower shall be NOMINAL MIX CONCRETE and above M20, M40, M45, shall be DESIGN MIX CONCRETE.

7.2 Design Mix Concrete

7.2.1 Mix Design & Testing

For Design Mix Concrete, the mix shall be designed according to IS:10262 and SP:23 to provide the grade of concrete having the required workability and characteristic strength not less than appropriate values given in IS:456. The design mix shall in addition to such that it is cohesive and does not segregate and should result in a dense and durable concrete and also capable of giving the finish as specified. For liquid retaining structures, the mix shall also
result in water tight concrete. The Contractor shall exercise great care while designing the concrete mix and executing the works to achieve the desired result.

The minimum cement content and maximum free water-cement ratio for Design Mix Concrete shall be as per table – 5 of IS 456 for “Severe” category of exposure, unless noted otherwise in the specification document and shall be as required by RCC Consultant/ Architect-PMC/BPCL.

The minimum cement content stipulated in IS 456 shall be adopted irrespective of whether the Contractor achieves the desired strength with less quantity of cement. The Contractor's quoted rates for concrete shall provide for the above eventuality and nothing extra shall become payable to the contractor on this account. Even in the case where the quantity of cement required is higher than that specified above to achieve desired strength based on an approved mix design, nothing extra shall become payable to the Contractor.

It shall be Contractor’s sole responsibility to carry out the mix designs at his own cost. He shall furnish to RCC Consultant/ Architect-PMC/BPCL at least 30 days before concreting operations, a statement of proportions proposed to be used for the various concrete mixes and the strength results obtained. The strength requirements of the concrete mixes ascertained on 150 mm cubes as per IS:516 shall comply with the requirements of IS:456. The mix design shall be approved by the RCC Consultant/ Architect-PMC/BPCL before starting the concrete work.

Range of slumps which shall generally be used for various types of constructions shall be as per clause 7.1 of IS:456 unless instructed otherwise by RCC Consultant/ Architect-PMC/BPCL.

7.2.2 Ready Mix Concrete (RMC)-Batching & Mixing of Concrete

Ready Mix Concrete (RMC) may be manufactured in a central automatic weigh bathing plant and transported to the site by agitating Transit Mixers.

Proportions of aggregates and cement, as decided by the concrete mix design, shall be by weight. These proportions shall be maintained during subsequent concrete batching by means of weigh batchers capable of controlling the weights within one percent of the desired value.

Amount of water added shall be such as to produce dense concrete of required consistency, specified strength and satisfactory workability and shall be so adjusted to account for moisture content in the aggregates. Water- cement ratio specified for use by RCC Consultant shall be maintained.

Arrangement should be made by Contractor to have the cubes tested in an approved
laboratory or in field at his own expense, with prior consent of RCC Consultant/ Architect-PMC/BPCL. However, cube testing to be done through approved laboratories compulsorily (even if contractor arranges to set up his site laboratory), percentage of which shall be decided by RCC Consultant/ Architect-PMC/BPCL. Sampling and testing of strength and workability of concrete shall be as per IS:1199, IS:516 and IS:456.

Ready-mixed concrete shall conform with IS:4926 specifications and shall be used as per the plant approved by RCC Consultant/ Architect-PMC/BPCL.

During execution, delivery notes/ challens should be made available by Contractor for inspection throughout the duration of the contract. One set of all delivery notes/ Challens to be provided by Contractor for BPCL record.

Samples of concrete shall be taken in accordance with the requirements of the specification at the point and time of delivery. The sampled concrete shall be tested in accordance with the specification. The test results shall be certified by RCC Consultant/ Architect-PMC/BPCL before submission of bill.

If at any time the RCC Consultant/ Architect-PMC/BPCL is not satisfied with the ready-mixed concrete complies with the specification, RCC Consultant/ Architect-PMC/BPCL may alter the frequency of the sampling and may change the approved plant.

7.3 **NOMINAL MIX CONCRETE**

7.3.1 **Mix Design & Testing**

Proportions for Nominal Mix Concrete and w/c ratio may be adopted as per IS: 456 and as per RCC Consultant requirements. Works tests shall be carried out as per IS: 456. However, it will be contractor’s sole responsibility to adopt appropriate nominal mix proportions to yield the specified strength.

Batching & Mixing of Concrete shall be based on the adopted nominal mixes; aggregates shall be measured by volume. However, cement shall be by weight only.

7.4 **Use of Fly Ash Blended Cements in Cement Concrete (PPCC) in RCC Structures**

Subject to General Guidelines detailed out, PPC manufactured conforming to IS 1489(Part-I) shall be treated at par with OPC for manufacture of Design Mix Concrete for structural use in RCC.

Fly ash Blended Cements conforming to IS 1489 (Part I) may be used in RCC structures as per guidelines given below:-
(i) Till the time, BIS makes it mandatory to print the %age of fly ash on each bag of cement, the certificate from the PPC manufacture indicating the same shall be insisted upon before allowing use of such cements in works.

(ii) While using PPC for structural concrete work, no further admixing of fly ash shall be permitted.

(iii) IS 456- 2000 Code of Practice for Plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete Mix Proportion and its production.

(iv) Concrete shall be manufactured in accordance with IS 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

(v) The mechanical properties such as modulus of elasticity, tensile strength, creep and shrinkage of fly ash mixed concrete or concrete using fly ash blended cements (PPCs) are not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC.

(vi) To control higher rate of carbonation in early ages of concrete in PPC based concrete; water/binder ratio shall be kept as low as possible, which shall be closely monitored during concrete manufacture.

(vii) If necessitated due to low water/binder ratio, required workability shall be achieved by use of chloride free chemical admixtures conforming to IS 9103. The compatibility of chemical admixtures and super plasticizers with each set OPC, fly ash and /or PPC received from different sources shall be ensured by trials.

(viii) Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot & arid regions, the minimum curing period shall be 14 days or its equivalent.

8. FORMWORK

A) General

1. Formwork shall be all inclusive and shall consist of but not limited to shores, bracings, sides of footings, walls, beams and columns, bottom of slabs etc. including ties, anchors, hangers, inserts, false work, wedges etc. This is including all temporary or permanent forms or moulds required for forming the concrete which is cast-in-situ, together with all temporary construction required for their support.

2. The design and engineering of the formwork as well as its construction shall be the responsibility of contractor. However, if so desired by RCC Consultant/ Architect-PMC/BPCL the drawings and calculations for the design of the formwork shall be submitted to RCC Consultant/ Architect-PMC/BPCL for approval.

3. The formwork may be of timber, plywood, steel, plastic or concrete depending upon the type of finish specified. Sliding forms and slip form may be used with the approval of RCC Consultant/ Architect-PMC/BPCL. Timber for formwork shall be well seasoned, free from sap, shakes, loose knots, worm holes, warps and other surface defects. Joints between formwork and formwork and structures shall be sufficiently tight to prevent loss of slurry from concrete, using seals if
4. The faces of formwork coming in contact with concrete shall be cleaned and two coats of approved mould oil applied before fixing reinforcement. All rubbish, particularly chippings, shavings, sawdust, wire pieces dust etc. shall be removed from the interior of the forms before the concrete is placed. Where directed, cleaning of forms shall be done by blasting with a jet of compressed air at no extra cost.

5. Forms intended for reuse shall be treated with care. Forms that have deteriorated shall not be used. Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes suitably plugged, joints repaired and warped lumber replaced to the satisfaction of RCC Consultant/ Architect-PMC/BPCL. Contractor shall equip himself with enough shuttering to allow for wastage so as to complete the job in time.

6. Wire ties passing through beams, columns and walls shall not be allowed. In their place bolts passing through sleeves shall be used. Formwork spacers left in situ shall not impair the desired appearance or durability of the structure by causing spalling, rust staining or allowing the passage of moisture.

7. For liquid retaining structures, sleeves shall not be provided for through bolts nor shall through bolts be removed if provided. The bolts, in the latter case, shall be cut at 25 mm depth from the surface and the hole made good by cement mortar of the same proportion as the concrete just after striking the formwork.

8. Contractor shall provide adequate props carried down to a firm bearing without overloading any of the structures. It shall be the contractors responsibility to ensure the safety of centering/ shuttering during erection and during after concreting.

9. The shuttering for beams and slabs shall be so erected that the side shuttering of beams can be removed without disturbing the bottom shuttering. If the shuttering for a column is erected for the full height of the column, one side shall be built up in sections as placing of concrete proceeds or windows left for placing concrete from the side to limit the drop of concrete to 1.0m or as directed by RCC Consultant/ Architect-PMC/BPCL. The stripping period for formwork shall be followed as per relevant IS Code and as per the requirement of RCC Consultant/ Architect-PMC/BPCL.

10. Minimum Cover as per drawing/as directed by RCC Consultant shall be strictly maintained. Cover blocks of concrete/plastic as approved shall be used and should have a strength (to be tested) at least equal to the strength of concrete for which it is being used.

11. Contractor shall temporarily and securely fix items to be cast in (embedments/ inserts) in a manner that will not hinder the striking of forms or permit loss of grout. Formwork showing excessive distortion during any stage of construction shall be repositioned and strengthened. Placed concrete affected by faulty formwork, shall be entirely removed and formwork corrected prior to placement of new concrete at contractor’s cost.
12. If RCC Consultant/ Architect-PMC/BPCL rejects any improper formwork after inspection, at any stage of construction, it is responsibility of the contractor to get corrected before Concreting at no extra cost to the BPCL.

13. Under normal circumstances forms may be struck after expiry of the time period given in IS: 456 unless otherwise directed by RCC Consultant/ Architect-PMC/BPCL. It is the contractor's responsibility to ensure that forms are not struck until the concrete has developed sufficient strength to support itself, does not undergo excessive deformation and resist surface damage and any stresses arising during the construction period.

14. Formwork shall be designed to fulfill the following requirements in addition to above requirements:

a. Sufficiently rigid and tight to prevent loss of grout or mortar from the concrete at all stages and appropriate to the methods of placing and compacting.

b. Capable of providing concrete of the correct shape and surface finish within the specified tolerance limit as per IS 456.

c. Capable of withstanding without deflection the worst combination of self weight, reinforcement and concrete weight, all loads and dynamic effects arising from construction and compacting activities, wind and weather forces.

d. Capable of easily striking without shock, disturbance or damage to the concrete. Soffit forms capable of imparting a camber if required. Soffit forms and supports capable of being left in position if required.

e. Capable of being cleaned and/or coated if necessary immediately prior to casting the concrete; design temporary openings where necessary for these purposes and to facilitate the preparation of construction joints.

15. Contractor to follow the formwork design suggested by RCC Consultant/ Architect-PMC/BPCL. The formwork design such as Steel wall formwork, wall forms, detailed fixing of wall ties, detailing of standard units of formwork along with typical components required, Typical arrangement of column form work, column shuttering, detailing of beam head stiffeners, details of multistage shuttering shall be followed by contractor as per the requirement of RCC Consultant/ Architect-PMC/BPCL.

B) Formwork for exposed Architectural Concrete

The specifications as given in CPWD shall generally be followed. However, the contractor to note the following:

1. Since the exposed concrete is intended to make a visual appearance, the Contractor to ensure that the concrete on de-shuttering presents a clean and even surface. No surface treatment (apart from application of hydrophobic sealant) is envisaged and therefore no repair/patchwork will be permitted.

2. Form exposed corners of beams and columns to produce square/circular, smooth, solid,
unbroken lines, except as otherwise shown.

3. The Contractor to furnish the shutter boards in largest practicable sizes to minimize number of
   joints and to conform to joint system shown on drawings.

4. All formed joints on concrete surfaces to be exposed shall be taped and shall align so joints will
   not be apparent on the concrete surfaces.

5. The location of all exposed features such as through tie bolts, joints to be planned in such a way
   that no bolt hole/joint line etc. Seems to be arbitrary and/or out of place.

6. The shuttering should be of superior construction so as to avoid slurry leakage and consequent
   honeycombing etc.

7. The pattern of formwork for exposed concrete works shall be approved by the RCC Consultant/
   Architect-PMC/BPCL prior to execution.

8. If required, the Contractor shall have to prepare a mock-up of the formwork for typical members
   and carry out trial castings to establish the suitability of formwork, of mould oil proposed to be
   used on formwork as a releasing agent to prevent surface blemishes etc.

9. REINFORCEMENT WORKMANSHIP

1. Reinforcing bars supplied bent or in coils shall be straightened cold without damage at no extra
   cost.

2. All bars shall be accurately bent gradually and according to the sizes and shapes shown on the
   drawings/ schedules and as directed by RCC Consultant/ Architect-PMC/BPCL. Re-bending or
   straightening incorrectly bent bars shall not be done without approval of RCC Consultant/
   Architect-PMC/BPCL.

3. Reinforcement shall be accurately fixed and maintained firmly in the correct position by the use
   of blocks, spacers, chairs, binding wire etc. to prevent displacement during placing and
   compaction of concrete. The tied in-place reinforcement shall be approved by RCC Consultant/
   Architect-PMC/BPCL prior to concrete placement. Spacers shall be of such materials and designs
   as will be durable, not lead to corrosion of the reinforcement and not cause spalling of the
   concrete cover.

4. Binding wire shall be 16 gauge black soft annealed wire as approved by RCC Consultant. Ends of
   the binding wire shall be bent away from the concrete surface and in no case encroach into
   the concrete cover.

5. Substitution of reinforcement, laps/splices not shown on drawing shall be subject to RCC
   Consultant/ Architect-PMC/BPCL approval.

6. Tolerances on placing of reinforcement and Tolerance for cover shall be as per IS:456.

10. TOLERANCES
    Tolerance for formed and concrete dimensions shall be as per IS:456 unless specified otherwise.
    Tolerances specified for horizontal or vertical building lines or footings shall not be construed to
    permit encroachment beyond the legal boundaries.

11. PREPARATION PRIOR TO CONCRETE PLACEMENT

    Before concrete is actually placed in position, the inside of the formwork shall be cleaned and
mould oil applied, necessary inserts/embedment/pipe sleeves and reinforcement shall be correctly positioned and securely held, necessary openings, pockets, etc. provided. All arrangements-formwork, equipment and proposed procedure, shall be approved by RCC Consultant/ Architect-PMC/BPCL. Contractor should have to maintain separate Pour Card for each pour as per the format approved by RCC Consultant/ Architect-PMC/BPCL.

Before Concreting inspection shall be carried out by RCC Consultant/ Architect-PMC/BPCL for foundation strata, steel reinforcement placement/correctness, Shuttering/centering/formwork, alignment/ line/levels of member to be constructed. Correction which has been indicated by RCC Consultant/ Architect-PMC/BPCL have to be corrected by contractor on immediate basis. After corrections, again inspection shall be done by RCC Consultant/ Architect-PMC/BPCL. Concreting shall be started only after the approval of RCC Consultant/ Architect-PMC/BPCL and filling of the pour card for concreting as approved.

Embedment of hooks, hangers, boxes or any insertions for hanging fans, lights, false ceiling, making of opening as required etc. shall be carried out by contractor without any extra cost to BPCL.

12. TRANSPORTING, PLACING AND COMPACTING CONCRETE

Concrete shall be transported from the RMC plant to the formwork with minimum time lapse by methods that shall maintain the required workability and will prevent segregation, loss of any ingredients or ingress of foreign matter or water. In all cases concrete shall be deposited as nearly as practicable directly in its final position. To avoid segregation, concrete shall not be rehandled or caused to flow. For locations where direct placement is not possible and in narrow forms contractor shall provide suitable drops and "Elephant Trunks". Minimum diameter of Elephant Trunks shall be 200mm. Concrete shall not be dropped from a height of more than 1.5m. Concrete shall not be placed in flowing water.

The contractor shall obtain from the producer and maintain on site the nature and source of each constituent, Source of supply of cement, Proposed proportions or quantity of each constituent per cum of concrete

While placing concrete the contractor shall proceed as specified below and also ensure the following :

a) Continuously between construction joints and predetermined abutments.
b) Without disturbance to forms or reinforcement.
c) Without disturbance to pipes, ducts, fixtures and the like to be cast in; ensure that such items are securely fixed. Ensure that concrete cannot enter open ends of pipes and conduits etc.
d) Without dropping in a manner that could cause segregation or shock.
e) In deep pours only when the concrete and formwork designed for this purpose and by using suitable chutes or pipes.
f) Do not place if the workability is such that full compaction cannot be achieved.
g) Without disturbing the unsupported sides of excavations; prevent contamination of concrete with earth. Provide sheeting if necessary. In supported excavations, withdraw the linings progressively as concrete is placed.
h) If placed directly onto hard core or any other porous material, dampen the surface to reduce loss of water from the concrete.
i) Ensure that there is no damage or displacement to sheet membranes.
j) Record the time and location of placing structural concrete.

Concrete shall normally be compacted in its final position within thirty minutes of leaving the mixer. Concrete shall be compacted during placing with approved vibrating equipment without causing segregation until it forms a solid mass free from voids thoroughly worked around reinforcement and embedded fixtures and into all corners of the formwork.

Immersion vibrators shall be inserted vertically at points not more than 450 mm apart and withdrawn slowly till air bubbles cease to come to the surface, leaving no voids. When placing concrete in layers advancing horizontally, care shall be taken to ensure adequate vibration, blending and melding of the concrete between successive layers. Vibrators shall not be allowed to come in contact with reinforcement, formwork and finished surfaces after start of initial set. Over-vibration shall be avoided.

Concrete may be conveyed and placed by mechanically operated equipment after getting the complete procedure approved by RCC Consultant/ Architect-PMC/BPCL. The slump shall be held to the minimum necessary for conveying concrete by this method. When concrete is to be pumped, the concrete mix shall be specially designed to suit pumping. Care shall be taken to avoid stoppages in work once pumping has started.

Except when placing with slip forms, each placement of concrete in multiple lift work, shall be allowed to set for at least 24 hours after the final set of concrete before the start of subsequent placement. Placing shall stop when concrete reaches the top of the opening in walls or bottom surface of slab, in slab and beam construction, and it shall be resumed before concrete takes initial set but not until it has had time to settle as determined by RCC Consultant/ Architect-PMC/BPCL. Concrete shall be protected against damage until final acceptance.

All necessary equipment required for concrete works shall be maintained in clean and good working condition by the contractor. In case RCC Consultant/ Architect-PMC/BPCL feels that the equipment is not maintained properly, it will rejected and contractor shall replace with new equipment at no extra cost to the BPCL.

13. MASS CONCRETE WORKS

Sequence of pouring for mass concrete works especially Slab casting shall be as approved by RCC Consultant/ Architect-PMC/BPCL. Contractor shall exercise great care to prevent shrinkage cracks and shall monitor the temperature of the placed concrete.
14. CURING

Curing shall start immediately after the compaction of the concrete to protect it from
a) Premature drying out, particularly by solar radiation and wind;
b) Leaching out by rain and flowing water;
c) Rapid cooling during the first few days after placing;
d) High internal thermal gradients;
e) Low temperature or frost;
f) Vibration and impact which may disrupt the concrete and interfere with its bond to the reinforcement.

All concrete, unless directed otherwise by RCC Consultant/ Architect-PMC/BPCL, shall be cured by use of continuous sprays or ponded water or continuously saturated coverings of sacking, canvas, hessian or other absorbent material for the period of complete hydration with a minimum of 7 days or as specified in relevant IS Code. The quality of curing water shall be the same as that used for mixing. Where a curing membrane is directed to be used by the RCC Consultant/ Architect-PMC/BPCL, the same shall be of a non-wax base and shall not impair the concrete finish in any manner. Curing shall be carried out generally as per ACI:307.

Generally curing by using water will be done. However, in case curing by chemical compound is required as per RCC Consultant for use shall comply with ASTM C 309. The curing compound to be used shall be got approved from the RCC Consultant/ Architect-PMC/BPCL before use and shall be applied with spraying equipment capable of a smooth, even textured coat, generally in conformity with recommendations of the manufacturer.

Curing may also be done by covering the surface with an impermeable material such as polyethylene, which shall be well sealed and fastened. Extra precautions shall be exercised in curing concrete during cold and hot weather.

18. CONSTRUCTION JOINTS AND KEYS

Construction joints will be as shown on the drawing or as approved by RCC Consultant/ Architect-PMC/BPCL. Concrete shall be placed without interruption until completion of work between construction joints. If stopping of concreting becomes unavoidable anywhere, a properly formed construction joint shall be made with the approval of RCC Consultant/ Architect-PMC/BPCL.

Dowels for concrete work, not likely to be taken up in the near future, shall be coated with cement slurry and encased in lean concrete as indicated on the drawings or as directed by RCC Consultant/ Architect-PMC/BPCL.

Before resuming concreting on a surface which has hardened, all laitance and loose stone shall be thoroughly removed by wire brushing/hacking and surface washed with high pressure water jet and treated with thin layer of cement slurry with water proofing/bonding compound for vertical
joints and a 15mm thick layer of cement sand mortar with water proofing/bonding compound for horizontal layers, the ratio of cement and sand being the same as in the concrete mix.

When concreting is to be resumed on a surface which has not fully hardened, all laitance shall be removed by wire brushing, the surface wetted, free water removed and a coat of cement slurry applied. On this a layer of concrete not exceeding 150 mm thickness shall be placed and well rammed against the old work. Thereafter work shall proceed in the normal way.

20. FINISHES

20.1 GENERAL

The formwork for concrete works shall be such as to give the finish as specified. The contractor shall make good any unavoidable defects as directed consistent with the type of concrete and finish specified; defects due to bad workmanship (e.g. damaged or misaligned forms, defective or poorly compacted concrete) will not be accepted. Contractor shall construct the formwork using the correct materials as directed by RCC Consultant/Architect-PMC/BPCL and to meet the requirements of the design and to produce finished concrete to required dimensions, plumbs, planes and finishes.

20.1.1 Surface Finish Type F1

This type of finish shall be for non-exposed concrete surfaces against which back fill or concrete is to be placed. The main requirement is that of dense, well compacted concrete. No treatment is required except repair of defective areas, filling all form tie holes and cleaning up of loose or adhering debris.

20.1.2 Surface Finish Type F2

This type of finish shall be for all concrete work which will be exposed to view upon completion of the job. The appearance shall be that of a smooth dense, well-compacted concrete showing the slight marks of well fitted shuttering joints. The contractor shall make good any blemishes.

20.1.3 Surface Finish Type F3

This type of finish shall be for concrete work which will be exposed to view but to give an appearance of smooth, dense, well-compacted concrete with no shutter marks, stain free and with no discolouration, blemishes, arrises, airholes etc. Only lined or coated plywood with very tight joints shall be used to achieve this finish. The panel size shall be uniform and as large as practicable. Any minor blemishes that might occur shall be made good by contractor.
21. REPAIR AND REPLACEMENT OF UNSATISFACTORY CONCRETE

Immediately after the shuttering is removed, all the defective areas such as honey-combed surfaces, rough patches, holes left by form bolts etc. shall be brought to the notice of RCC Consultant/Architect-PMC/BPCL who may reject the concrete work and may require to demolish the casted portion or permit patching of the defective areas with required polymer. All through holes for shuttering shall be filled for full depth and neatly plugged flush with surface. Rejected concrete shall be removed and replaced by contractor at no additional cost to BPCL.

For patching of defective areas, all loose materials shall be removed and the surface shall be prepared as directed by the RCC Consultant/Architect-PMC/BPCL. Bonding between hardened and fresh concrete shall be done either by placing cement mortar or by applying epoxy. The decision of the RCC Consultant/Architect-PMC/BPCL as to the method of repairs to be adopted shall be final and binding on the contractor and no extra claim shall be entertained on this account.

The surface shall be saturated with water for 24 hours before patching is done with 1:5 cement sand mortar. The use of epoxy for bonding fresh concrete shall be carried out as directed by RCC Consultant/Architect-PMC/BPCL.

22. VACUUM DEWATERING OF SLABS

Surface compaction and vacuum dewatering to be done for Plinth PCC and Terrace Slab as specified by RCC Consultant. It shall be finished by vacuum dewatering including all operations such as poker vibration, surface vibration, vacuum processing, floating and trowelling as per equipment manufacturers recommendation. The equipment to be used shall be subject to RCC Consultant/Architect-PMC/BPCL approval.

23. WEATHER REQUIREMENTS

Concreting during hot weather shall be carried out as per IS:7861 (Part I). Concreting during cold weather shall be carried out as per IS:7861 (Part II). Approved anti-freeze/accelerating additives shall be used where directed without any extra cost to BPCL.

24. WATER RETAINING STRUCTURES

The contractor shall take special care for concrete for underground structures such as water tank etc. and those others specifically called for to guarantee the finish and water tightness. Construction of water retaining structures shall generally follow the requirements of IS:3370.

The minimum level of surface finish for liquid retaining structures shall be Type F2. All such structures shall be hydro-tested. The contractor shall include in his price, hydrotesting of structures including all arrangements for testing such as temporary bulkheads, pressure
gauges, pumps, pipelines etc.

All temporary arrangements that may have to be made to ensure stability of structures during testing shall also be considered while quoting rates.

Any leakage that may occur in the structures shall be effectively stopped either by cement/epoxy pressure grouting, guniting or such other methods as may be approved by the RCC Consultant/Architect-PMC/BPCL. All such rectification shall be done by the contractor to the entire satisfaction of the RCC Consultant/Architect-PMC/BPCL at no extra cost to the BPCL.

25. TESTING CONCRETE STRUCTURES FOR LEAKAGE

Hydro-static test for water tightness shall be done at full storage level or soffit of cover slabs, as may be directed by RCC Consultant/Architect-PMC/BPCL. The test procedure to be followed as per relevant IS Code or as directed by RCC Consultant/Architect-PMC/BPCL.

26. TESTS

Testing of major constructional material such as cement, sand, coarse aggregates, reinforcement, blocks, water, tiles, woodwork, plywood, etc. shall have to be compulsorily done as per the frequency decided by RCC Consultant/Architect-PMC/BPCL in line with relevant IS Codes.

Also, if the RCC Consultant/Architect-PMC/BPCL feels that the materials mentioned above are not in accordance with the specifications or if specified concrete strengths are not obtained, he may order tests to be carried out on these materials in laboratory, to be approved by the RCC Consultant/Architect-PMC/BPCL, as per relevant IS Codes.

For all tests, Contractor shall have to arrange for testing of material at his own cost including loading/unloading, manpower, transportation etc. complete.

Compressive strength test shall be carried out at 7 days to get a quicker idea of the quality of concrete, 28 days strength shall be carried out for the criteria for acceptance or rejection of concrete.

In addition to the above, minimum 5% or more of structural elements shall be tested by non-destructive tests such as rebound hammer test or Ultrasonic pulse velocity tests or probe penetration or maturity test as recommended by RCC Consultant/Architect-PMC/BPCL.

Test certificate shall be furnished for all steel reinforcement brought to site. Samples from each batch shall be taken as instructed and tested for tests as required by RCC Consultant/Architect-PMC/BPCL from an approved laboratory.
In the event of any work being suspected of faulty material or workmanship requiring its removal or if the works cubes do not give the stipulated strengths, RCC Consultant/Architect-PMC/BPCL reserves the right to order the contractor to take out cores and conduct tests on them or do ultrasonic testing or load testing of structure, etc. All these tests shall be carried out by contractor at no extra cost to the BPCL. Alternately RCC Consultant/Architect-PMC/BPCL also reserves the right to ask the contractor to dismantle and re-do such unacceptable work at the cost of contractor.

If the structure is certified by RCC Consultant/Architect-PMC/BPCL as having failed, the cost of the test and subsequent dismantling/reconstruction shall be borne by contractor.

27. INSPECTION

All materials, workmanship and finished construction shall be subject to continuous inspection and approval of RCC Consultant/Architect-PMC/BPCL. Materials rejected by RCC Consultant/Architect-PMC/BPCL shall be expressly removed from site and shall be replaced by contractor immediately at no extra cost to BPCL.

28. CLEAN-UP AND HACKING

Upon the completion of concrete work, all forms, equipment, construction tools, protective coverings and any debris, scraps of wood, etc. resulting from the work shall be removed and the premises should be left clean.

All concrete shall be hacked to make the surface sufficiently rough to provide the key for plaster. Date of Concreting to be marked on all columns, beams, slabs etc. after stripping of forms and clean up.

29. CHECKING VERTICALITY, ECCENTRICITY AND LEVELS OF THE STRUCTURES

During the progress of the construction, the contractor shall check the levels of the floors, the verticality and eccentricity of all the vertical structural members. Such checking shall be carried out with appropriate survey equipment by an independent registered land surveyor for all floors of the building structures, one floor at a time and as soon as the structural works for each floor are completed.

The contractor shall submit two sets of the surveyor’s report and field readings compiled in an approved format to the RCC Consultant/Architect-PMC/BPCL as and when they are completed. Such report shall indicate the levels, verticality, eccentricity and deviation, if any, of the building structures.

The checking of the levels, verticality and eccentricity of the building structures and the
submission of such reports to the RCC Consultant/Architect-PMC/BPCL shall not relieve the contractor of any of his duties or responsibilities under the contract.

30. SAMPLING AND STRENGTH OF DESIGNED CONCRETE MIX

Samples from fresh concrete shall be taken as per IS 1199 and cubes shall be made, cured and tested at 7 days and 28 days in accordance with IS 516.

Frequency of sampling, Test specimen and Test results of sample shall be as per IS 456. Any other tests such as for workability, durability, etc, required at field shall be done as per IS 456.

31. ACCEPTANCE CRITERIA

1. Any concrete work shall satisfy the requirements given below individually and collectively for it to be acceptable.

   a) Properties of constituent Materials;
   b) Characteristic compressive strength;
   c) specified mix proportions;
   d) Minimum cement content;
   e) Maximum free-water/cement ratio;
   f) Workability;
   g) Temperature of fresh concrete;
   h) Density of fully compacted concrete;
   i) Cover to embedded steel;
   j) Curing;
   k) Tolerances in dimensions;
   l) Tolerances in levels;
   m) Durability;
   n) Surface finishes;
   o) Water tightness
   p) Special requirements such as;
      i) Resistance to aggressive chemicals
      ii) Resistance to freezing and thawing
      iii) Very high strength
      iv) Improved fire resistance
      v) Wear resistance
      vi) Resistance to early thermal cracking

   The RCC Consultant/Architect-PMC/BPCL’s decision as to the acceptability or otherwise of any concrete work shall be final and binding on the contractor.

   For work not accepted, the RCC Consultant/Architect-PMC/BPCL may review and
decide whether remedial measures are feasible so as to render the work acceptable. The RCC Consultant/Architect-PMC/BPCL shall in that case direct the contractor to undertake and execute the remedial measures. These shall be expeditiously and effectively implemented by the contractor. Nothing extra shall become payable to the contractor by the BPCL for executing the remedial measures.

2. Sampling frequency for concrete:-
   The minimum frequency of sampling for concrete shall be in accordance with following:-

<table>
<thead>
<tr>
<th>Quantity of concrete in the work (Cum)</th>
<th>No of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>1</td>
</tr>
<tr>
<td>6-15</td>
<td>2</td>
</tr>
<tr>
<td>16-30</td>
<td>4</td>
</tr>
<tr>
<td>31-50</td>
<td>4</td>
</tr>
<tr>
<td>51-above</td>
<td>4 plus one additional for 50 cum or part therof</td>
</tr>
</tbody>
</table>

32. FIELD LABORATORY

The contractor shall establish fully equipped field laboratory to carry out all preliminary tests to work out grading and proportioning of aggregate in order to obtain and maintain uniform quality of work. The contractor shall supply all material, labour and testing machine as per list below for preparing and testing samples as required unless otherwise specified in the detailed item wise specifications, number of cubes to be taken and tested shall be as per relevant IS Code/standard of practice.

Equipments for Field Laboratory

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Equipments</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Slump Cone</td>
<td>2 Nos</td>
</tr>
<tr>
<td>2</td>
<td>Cube moulds</td>
<td>24 Nos</td>
</tr>
<tr>
<td>3</td>
<td>Cement Testing equipments</td>
<td>1 Set</td>
</tr>
<tr>
<td>4</td>
<td>Oven</td>
<td>1 No</td>
</tr>
<tr>
<td>5</td>
<td>Cube Testing Machine</td>
<td>1 No</td>
</tr>
<tr>
<td>6</td>
<td>Weigh balance</td>
<td>1 No</td>
</tr>
<tr>
<td>7</td>
<td>Spring balance</td>
<td>1 No</td>
</tr>
<tr>
<td>8</td>
<td>I.S. Sieves</td>
<td>1 Set</td>
</tr>
<tr>
<td>---</td>
<td>---------------------</td>
<td>-------</td>
</tr>
<tr>
<td>9</td>
<td>Twister meter</td>
<td>1 No</td>
</tr>
<tr>
<td>10</td>
<td>Micro meter</td>
<td>1 No</td>
</tr>
<tr>
<td>11</td>
<td>Silt Measuring Jars</td>
<td>4 Nos</td>
</tr>
</tbody>
</table>

**MASSONARY WORK**

1. Blocks:- Autoclaved Aerated Concrete (AAC) blocks shall generally confirm to IS 2185 and the minimum average compressive strength shall be as of Grade 1 mentioned in the IS 2185. Blocks shall be regular in size and shape and shall be of specified strength. Blocks shall be properly cured before they are brought to site. Half or three quarter size blocks are to be used wherever required to make up length of wall and broken blocks shall not used.

2. The texture of the blocks shall be such that plaster will adhere to it. The contractor shall supply samples for approval. Blocks supplied shall confirm to approved samples. The blocks shall be tested for as per IS 2185 and other relevant IS Codes as per sampling frequencies mentioned there in before using for works

3. Where ever the block work and R.C.C column/beam meets, joints shall be fixed with fiber mesh / chicken mesh before internal and external plastering.

4. Block work should be laid on a layer 100mm thk Water Proof M20 concrete

5. All block work shall be plumb, square/rectangular and properly bonded. The thickness of courses shall be uniform with courses horizontal.

6. For setting out of rooms / corridors /walls a layer of block work shall be laid on 100 mm thk waterproof M20 concrete and after the checking of right angles, lines, levels and satisfaction of Architect-PMC / BPCL, the balance shall be constructed as per the drawings.

7. Blocks shall be so laid that all joints are well filled with mortar. The thickness of joints shall not be less than 6mm and not more than 8mm. The face joints shall be raked to a minimum depth of 10mm by raking tools during the progress of work when the mortar is still green, so as to provide a proper key for the plaster or pointing.

8. When plastering or pointing is not required, the joints shall be struck flush. For pointed masonry without plaster, smooth textured concrete block shall be used. The face of blocks work shall be kept clean at all times.

9. Where block are to be used for load bearing walls, the uppermost layer of block masonry supporting slab or other structured members, shall be solid or treated as directed by the Architect-PMC / BPCL.
10. The cement used shall be as per I.S. 1489 PPC/ IS 8112 (43 grade) OPC/ 12269 (53 grade) OPC whichever is approved.

11. Sand or M sand for masonry mortars shall have the quality and particle size grading conforming to IS. The grading of sand for use in mortar for unreinforced and reinforced block work shall be within the specified limits for respective works. Any deviation may be allowed at the discretion of Architect-PMC / BPCL. Sand shall be hard, durable, clean and free from dirt clay, organic matter or other impurities. Percentage of clay and all other deleterious substances shall not exceed as prescribed by IS Code.

12. Water shall be clean and free from oil, acid, salt and other injurious materials. Water fit for drinking will generally be found suitable. Water shall be obtained from sources approved by the Architect-PMC / BPCL.

13. Mix for mortar shall be as specified in the Schedule of items or shown on drawings. The cement and sand shall be mixed dry in specified proportions and then thoroughly mixed by adding just sufficient quantity of water to proper consistency. No mortar that has stood for more than half an hour shall be used. Mortar that shows a tendency to become dry before this time shall have water added to it and remixed. In buildings the mortar mix in R.C.C floors will not be allowed. Contractor has to provide M.S sheets / G.I sheets on floors for mortar mixing before placement.

14. All block work shall be kept continuously wet for at least 7 days from the date of laying of block work or as specified by manufacturer.

15. Embedment of Fixtures: All fixtures shall generally be embedded in mortar and masonry units and shall be cut as required. Iron and steel members partially embedded in block work shall be given a bituminous protective coating at the point of their entry into masonry. Door frames shall be provided with Anti-termite / bituminous coating before fixing.

16. While fixing door frames, holdfast should be fixed and casted in M20 concrete on both the sides. The concrete portion between door frame and masonry should be casted properly.

17. Upon completion of the masonry installation, all exposed block shall be cleaned of all mortar and cement grout incrustations and concrete stains. Protruding mortar joints shall be chipped off. As the cleaning progresses, all masonry work shall be examined and all imperfect joints nail, holes, cracks etc. shall be carefully filled with mortar where required and the horizontal racking left tooled and clean on completion of the work.

18. Sampling & Testing
   Sample of blocks shall be subjected to following test:
   i. Block Density
   ii. Compressive Strength
   iii. Drying Shrinkage
   iv. Thermal Conductivity
The frequency of sampling shall be as per relevant IS code or as directed by Architect-PMC / BPCL as per requirement.

PLASTERING

1. This section shall cover internal and external plastering/rendering works as shown in the drawings. Before commencing the work sample of works shall be made in accordance with the specifications indicated below and got approved by the Architect-PMC / BPCL.

2. Mortar: The mortar of specified mix shall be used. Cement and sand shall be tested as specified in the section on concrete. Mortar mixing in R.C.C slabs will not be allowed. Contractor shall provide MS/G.I sheet in floors for mixing of mortar before application.

3. Scaffolding: MS scaffolding shall be provided for plastering work as per standard practice and as directed by the Architect-PMC / BPCL.

4. Preparation of Surface: Joints of Block work shall be raked-out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scraping.

5. Shuttering imperfections of all concrete shall be roughened by hacking with chisel and all resulting dust and loose particles cleaned and the surface shall be thoroughly hacked or bush hammered to the satisfaction of the Architect-PMC / BPCL.

6. The surface shall be thoroughly washed with water, cleaned and kept wet before plastering is commenced. No plastering work shall be started before all conduits, pipes, fittings and fixtures clamps, hooks, doors and window frames etc. are embedded, grouted and cured and all defects removed to the satisfaction of the Architect-PMC / BPCL.

7. Where ever the block work and R.C.C column/beam meets, joints shall be fixed with fiber mesh / chicken mesh before internal and external plastering.

8. Special approval shall be taken from the Architect-PMC / BPCL before commencing each plastering work. No cutting of finished plaster shall be allowed under any circumstance. No portion shall be left out initially to be patched up later on.

9. All external R.C.C slabs projected beyond wall including drop slabs should have 20mm water drip course in bottom side and the same is to be done by the contractor free of cost.

10. Before plastering, the ceiling and column surfaces shall be hacked by hammer to get the necessary grip for the plastering.

11. Internal Plaster: Single coat ordinary cement / PPC and medium coarse sand mixed in proportion as described schedule of items 6 mm thick over the entire area of walls. This shall be finished just
with wooden float to give the best smooth surface. Second coat of Gypsum plaster shall be applied on all surfaces. Total thickness of plaster shall be 12mm for all walls.

12. Ceiling shall be prepared in the same way as described above and bonding coat of Bond it/ Hacked plast/or equivalent shall be applied for proper and long term durable bond of gypsum plaster with ceiling and and shall be finished to smooth surface. Total thickness of 6mm gypsum plaster shall be applied on ceiling.

13. Special care shall be taken to secure bond with the concrete/concrete block work. Before plastering, thickness modem shall be done in order to get the plumb/linear measurements as per the satisfaction of the Architect-PMC / BPCL.

14. Exterior Plaster: Exterior sand faced plaster where specified, or shown shall be of total 23 mm thick in two coats, the base coat shall be about 15mm thick and the second coat shall be 8 mm thick applied after the base coat has set but not dried. Both coats shall be 1:4 cement sand mortar (1 cement: 4 sand).

15. Plaster mortar to be prepared by adding water proofing compound , polypropylene /recron fibers as per manufacturers specification.

16. Mixing : The ingredients shall be mixed in specific proportions as prescribed. The mixing shall be done in a mechanical mixer or by hand mixing on water- tight platform. The cement and sand shall first be mixed thoroughly dry in the mixer. Water and water proofing compound shall then be added gradually and wet mixing continued for at least a minute until mortar attains the consistency of a stiff paste and uniform colour. Mortar shall be used within 30 minutes of addition of water. Mortar which has partially set shall not be used and removed from the site immediately.

17. Where ever hand mixing before application of plaster is being done, M.S/ G.I sheets in successive floors of the building shall be laid.

18. Wherever specified, water proofing compound of approved make shall be added to the mortar and mixed strictly in accordance with manufacturer's printed instructions.

19. Plastering at Junction of Masonry/R.C.C: GI/Fiber Mesh to be fixed at Junction to avoid cracks at junction of RCC and AAC block walls, 100-150mm wide GI chicken wire mesh of 20 or 22 guage or fiber mesh as approved by Architect-PMC/BPCL shall be used fixed with GI wire nails on the joints before plastering.
1. **General:**

1.1 This section shall cover all flooring and wall tiling work as shown in the drawing as mentioned in the schedule. No work under this section shall be started until specifically allowed by the Architect-PMC/BPCL and until all other major works such as plastering, embedding of conduits and pipes, channels, etc. have been completed.

1.2 Samples of basic materials & work of adequate size representing the nature of variation including quality, size, texture after finishing to be used in the flooring work shall be prepared for all work and got approved by Architect-PMC/BPCL sufficiently prior to ordering. The approved samples shall be retained up to the end of the project.

1.3 The works shall be got done by skilled and specialized workmen experienced in the respective trade of work.

1.4 Before starting the flooring works, contractor should clean the floor slab by removing any mortar stains, cement, dust etc. and apply/spread waterproofing coating over the RCC floor slab and show the water tightness of slab by ponding test. Flooring shall only be allowed on satisfactory completion of ponding test. In case of leakages in slab, contractor should arrange to rectify the as per RCC Consultants recommendations.

1.5 The skirting shall be flushed with wall plaster or projecting out uniformly by 6 mm from the wall plaster, as specified. The work shall be preferably carried out simultaneously with the laying of flooring.

2. **Vitrified / Ceramic Floor Tiles**

2.1 Make

Vitreous Ceramic and vitrified ceramic floor tiles shall be of approved quality and make conforming to relevant IS stipulations. They shall be flat, true to shape and free from cracks, crazing spots, chipped edges and corners. These shall be of specified size, type and colour and laid to pattern as shown in the drawings or as approved by the Architect-PMC/BPCL.

2.2. Sub-Base

The base shall first be prepared as indicated in the above clause 1.4.

2.3. Laying of Floor Tiles

After the base is cured, dried, cleaned & mopped, the bedding for the tile of average thickness as required and mentioned on drawing of cement mortar in 1:4 shall be laid on the surface and spread evenly with a trowel. Thickness modem shall be laid from staircase side to entire flood at a time to check the level of tiling.
The back of the tile previously cleaned and soaked in water shall be placed over the mortar and brought to proper level by striking gently with a wooden mallet.

2.3 Pointing
The tiles shall be laid in the manner as specified above in required pattern with as thin a joint / jointless as possible. The joints shall be thoroughly cleaned and pointed with white cement slurry admixed with pigment of matching colour as the tiles.

The surface of flooring shall be frequently checked with a straight edge about 2m long, so as to obtain a true surface with the required slope. Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster skirting or dado.

2.5. Cutting of Tiles
Care shall be taken to see that full tiles are used as far as possible. Where not possible, the edge tiles shall be neatly cut with a tile cutter to required size and the edges rubbed smooth to ensure straight and true joints. The cut edge of the tiles shall not be installed in exposed locations. In the staircase steps, tile edges/nosing to be chamfered to the satisfaction of Architect-PMC/BPCL without any extra cost.

2.6. Curing
The tiling shall be cured for 7 days or as specified by manufacturer with water and then thoroughly cleaned and dried.

2.7. Ceramic Wall Tile in Dado
Vitreous ceramic wall tiles shall be of approved quality and make. They shall be flat, true to shape and free from cracks, crazing spots, chipped edges and corners. These shall be specified size, type and colour and laid to pattern as shown in the drawings or as approved by the Architect-PMC/BPCL.

2.8. Preparation of Surfaces: The joints shall be raked out to a depth of at least 12 mm in masonry walls, while the masonry is being laid. In case of concrete walls, the surfaces shall be hacked and roughened with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting/dado is commenced.

2.9. Mortar: The surfaces of the tiles shall be plastered with 12mm thick cement mortar 1:4 shall be applied and allowed to harden slightly. The plaster shall be roughened with wire brushes or by scratching diagonal at close intervals.

2.10. Laying of Tiles: The tiles shall be soaked in water, adequately washed clean, sorted out and a coat of neat cement slurry applied liberally at the back of tiles and set in the bedding mortar. The tiles shall be tamped and corrected to proper plane and lines.

2.11 The tiles shall be set in the required pattern and butt jointed. The joints shall be as fine as possible and uniform. Top of skirting or dado shall be truly horizontal and joints truly vertical.
except where otherwise indicated. Where full size tiles cannot be fixed these shall be cut to the required size and their edges rubbed smooth. Care shall be taken to ensure that as far as possible cut tiles are used in non-exposed locations. Works shall be carried out in all areas only after a sample panel has been approved by the Architect-PMC/BPCL.

2.12. Pointing: After laying is complete, the joints shall be cleaned off the grey cement grout with wire brush and all dust and loose mortar removed. The joints shall then be flush pointed with white cement slurry if required admixed with approved pigments to match the colour of tiles.

2.13. Curing and Finishing
The surface shall be cleaned and kept wet by sprinkling water for seven days. The finished surface shall be clean & glossy free of patches and shall not sound hollow. Finished dry surfaces shall be washed with mild organic acid, if so required.

3. Granite Work

a. Granite Counter Top

Counter top of Granite shall be hard, sound, dense and homogeneous in texture in accordance to the sample & of the required size and thickness approved by the Architect-PMC/BPCL. It shall be reasonably uniform in colour, texture, pattern & shape and free from stains, cracks, decay and weathering and of specified quality, size and thickness.

The slabs shall be pre-polished or matte flamed finished in the factory before delivery. Before placing order a sample shall be installed at the site and got approved. Exposed edges to be half/full rounded as per the satisfaction of Architect-PMC/BPCL. Provision of holes for entry of gas/PVC/pipes to be done without any extra cost.

b. Dressing of Slabs
Every stone shall be accurately machine cut to the required size and shape so that a straight edge laid along the side of the stone is fully in contact with it. All angles and edges of the granite slabs shall be true, square or angular as required and free from chippings and the surface shall be true and plane.

c. The thickness of the slabs shall be shown in the drawing with allowable tolerance of ±2mm. In respect of length and breadth of slabs a tolerance of ±5mm will be allowed.

d. Laying
Sub-grade concrete or R.C.C. slab or brickwork on which the slabs are to be laid shall be cleaned, wetted and mopped. For patterned work the stone shall first be laid in position loose to ensure achievement of the required pattern and any adjustments required shall be made and all stone shall be wetted and washed just before placing and the bedding for the slabs shall be with mortar as described in the item.
The average thickness of the bedding mortar under the slab shall be to suite the overall thickness of flooring specified.

Mortar of the specified mix shall be spread under the area of each slab, roughly to the average thickness specified in the item. The pre polished slabs shall first be laid on top of the mortar in accordance with the approved drawing and pressed tapped with wooden mallet and brought to proper level in continuity with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar shall be allowed to stiffen slightly & uniformly and cement slurry of honey like consistency shall be spread over the same.

The edges of the slab already paved shall be buttered with grey or white cement with or without admixture of pigment to match the shade of the slabs as given in the description of the item. The slab to be paved shall then be lowered gently back in position and tapped with wooden mallet till it is properly bedded in level and line with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be cured for a minimum period of seven days.

The surface of the flooring as laid shall be true to falls and, slopes as required. The slabs shall be matched as shown in drawing or as instructed by the Architect-PMC/BPCL. The junction between wall plaster and floor shall be finished neatly and without waviness. Wherever required the flooring shall be laid in patterns and/or with brass divider strips as required.

4. INTERLOCKING BLOCK PAVING WORKS

4.1 The block for the paving works shall be of approved quality and make. The blocks shall be 60mm thick having and the specified size and type and grey or red or any other colour as required by Architect-PMC/BPCL.

4.2 Over the prepared and consolidated sub grade a layer of sub base using M sand / River Sand/ Crushed sand as approved shall be laid to falls and slopes to required thickness and compacted with 10 tonne roller. Over the prepared sub-base, a layer of combination of aggregate shall be leveled and compacted to the satisfaction of the Architect-PMC / BPCL.

4.3 The block shall be laid on top of the prepared base in required pattern as directed by the Architect PMC/BPCL. On completion of the laying work, the joints to be filled with fine sand/cement concrete and compacted as directed by the Architect-PMC/BPCL. When required, edge blocks shall be cut clean and sharp with approved tools and as per manufacturer's instructions. The cut edges shall be rubbed smooth before laying. Compaction methodology to be used as per recommended by the approved proprietary manufacturer. Any blocks damaged during laying shall be replaced. The entire work of the installation and materials shall meet the approval of the Architect-PMC/BPCL.
PAINTING

1. General
Work of painting shall be one of the last items of work and shall not be taken up until all other internal works except fittings & fixtures have been completed and approved. No work under this section shall start without approval from Architect-PMC/BPCL. The contractor shall ensure that approval has been obtained for all primer, paints, oils, texture rendering materials for each location/area to be finished and in respect to shades brand & manufacturer for such finishing materials, well in advance to commencement of work. All paints of premium quality shall be used.

The Scaffolding required for internal and external painting shall be of MS scaffolding as per standards.

2. Materials
All materials shall be the best of their kind and of approved manufacture for each item. Painting materials such as shellac, thinner, oils, driers, brushes, rollers etc. shall be of the best approved quality and type.

3. Sealed Containers
Paints of approved shade, brand & manufacturer shall be brought to the site of work by the Contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The empty containers shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from Architect-PMC/BPCL. The contractor shall produce invoices, test certificates of relevant painting materials before use.

4. Storage
All materials shall be stored in a neat and orderly fashion in one single clean space. Care shall be taken to maintain this place as clean and dust-free as possible.

5. Specialized Work
All work shall be done by the Contractor through specialized skilled workmen experienced in the trade. The Paint agency shall be an authorised applicator of manufacturer/ paint company.

6. Work as per Manufacturer's Instructions
All work shall be done strictly as per this specification and manufacturer's printed instructions. In case these specifications differ in any way from manufacturer’s instructions, the latter shall apply.

7. Samples
Before starting work under this section large size samples of all types of coating including preparation of surface shall be made at the site and approval obtained from the Architect-PMC/BPCL before proceeding with the finishing works. Only after specific approval has been given to the samples, work shall commence. The actual work shall be one as per the approved samples.
8. **Preparation**
   The plastered surfaces shall be allowed to dry out completely. All surfaces to be finished shall be thoroughly brushed and cleaned of mortar drops, dust, dirt, fungi, rust, mill-scale, efflorescence and all other extraneous material. All loose pieces and scales shall be removed by scrapping. Surfaces shall be thoroughly sand-papered to a smooth finish. Further preparation work shall be done as specified under different types of finishes. Before starting painting work all floors shall be washed clean and wiped dry. If the painting starts after floor tile works, contractor should provide polyfoam/plastic sheet over floor to protect the surface of tiles.

9. All finished surface shall be smooth and of even shade to the satisfaction of Architect-PMC/BPCL.

10. **Protection**
   All work done shall be thoroughly protected from damage at all times by suitable and appropriate methods to the satisfaction of Architect-PMC/BPCL. All other adjacent areas which may not have received the finish at the same time shall also be thoroughly protected by suitable canvas, paper covering or by some other approved method.

11. **Damages to be made good**
   Any damage or disfigurement of other works caused by the painting works shall be immediately made good. All paint spots and other stains shall be thoroughly and carefully removed from all floors, doors, windows, fittings, furniture, glass, hardware and all other surfaces required, by approved paint removers and the places left clean and tidy to the satisfaction of the Architect-PMC/BPCL.

**ALUMINIUM WORK**

1. Aluminium sections used for sliding windows, etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Architect-PMC/BPCL for technical, structural, functional and visual considerations.

2. The aluminium extruded sections shall conform to relevant IS codes and permissible dimensional tolerances of the extruded sections shall be as per relevant IS code and shall be such as not to impair the proper and smooth functioning/operation and appearance of door and windows.

3. Aluminium sliding windows, ventilators etc. shall be of sizes, sections and details as shown in the drawings. The details shown in the drawings may be varied slightly to suit the standards adopted by the manufacturers of the aluminium work, with the approval of Architect-PMC/BPCL.

4. Before proceeding with any fabrication work, the contractor shall prepare and submit, complete fabrication and installation drawings for each type of windows, ventilators etc. for the approval of the Architect-PMC/BPCL. If the sections are varied, the contractor shall obtain prior approval of Architect-PMC/BPCL and nothing extra shall be paid on this account.
5. The weight calculated on the basis of actual average (average of five samples) weight of composite section in kilogram correct to the second place of decimal shall be taken.

6. Testing for anodizing shall be done as per the relevant IS Code. All joints shall be sealed with approved sealants.

7. Glass to be used for windows should be as per the requirement of GRIHA, as mentioned in GRIHA scope of work.

**WATERPROOFING WORKS**

1. All waterproofing compounds/ chemicals to use as per the approved make and as per the procedure mentioned by waterproofing manufacturers.

2. The complete waterproofing works to be carried out through authorised applicator/agencies of waterproofing manufacturer as approved by Architect-PMC/BPCL after evaluating the credentials. The work has to be executed by the approved agency only and the contractor has to provide a guarantee for the water proofing for 10 years from the date of completion of work.

3. Before carrying out waterproofing works, surface shall be cleaned thoroughly of all contaminants like dust, traces of other material/compound, oil and grease. All surface imperfections, protrusions, structurally unsound and friable concrete must be removed.

**OTHER WORKS**

1. All internal frames to be coated with wood preservative & fire retardant paint from approved make.

2. Doors shall include all hardware brass/stainless steel Heavy duty hardware, locks, special door handles, door stopers etc. as specified in relative items and drawings. Size and type of door closer / floor-spring shall be suitable for types of door. The contractor shall give guarantee for performance of door closer / floor-spring from himself as well as from manufacturer.

3. Hardware such as Locks, Handles, Hinges, Tower Bolts, and Ball Catches etc. shall be as per approved list of makes, High quality & manufacturers. Alternative makes shall be used for these accessories after getting approval of Architect-PMC/BPCL.

4. Wardrobes, Storage units shall be all inclusive of hardware such as locks, handles, hydraulic hinges/normal but hinges/ other approved type, tower bolts, mirrors, ball catches, etc.

5. The plywood of various thicknesses i.e. 25mm, 19mm, 12mm etc. and shall be of marine ply variety.
6. The flush door shall be 45mm, 35mm etc. thick unless specified otherwise and solid core of block board type bonded with phenol formaldehyde synthetic resin thermo. The finish of shutter shall match the adjoining partitions and shall be laminated with 1mm lamination.

7. Wherever edges of polished Italian Marble/Granite either in cladding or in table tops are exposed, this shall include chamfering of edges and polishing of edges. Wherever polished granite is specified in floor or in cladding, the quoted rate shall include laying according to patterns or designs required by the Architect-PMC/BPCL. No extra payment will be made towards cutting and wastage in formation of patterns and designs.

8. The contractor should use only the best material Teakwood or as specified shall be of the best quality, free of defects of any kind. All plywood, laminate etc., shall comply with respective Indian standard (BIS). If required by Architect-PMC/BPCL, the contractor will be required to arrange for testing products and produce test certificate from recognized test houses to establish the quality of materials at his own cost. Any defective material not meeting with the standard shall be replaced at the contractor’s own cost. Manufacturer’s test certificates for all items have to be obtained and submitted to client time to time.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Material</th>
<th>Make</th>
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<tbody>
<tr>
<td>1</td>
<td>Cement</td>
<td>Ultra Tech/ACC/Birla / Vasavdatta / Ambuja To Comply with Green Building Criteria</td>
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<td>a</td>
<td>For Concrete (O.P.C.)</td>
<td>Birla / ACC / Vasavdatta / Ultratech /Ambuja To Comply with Green Building Criteria</td>
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<tr>
<td>b</td>
<td>For Concrete/ plaster work / Masonry / Flooring (PPC)</td>
<td>Birla / ACC / Vasavdatta / Ultratech /Ambuja To Comply with Green Building Criteria</td>
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<tr>
<td>2</td>
<td>Metal</td>
<td>As approved by Architect-PMC/ BPCL.</td>
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<tr>
<td>3</td>
<td>Sand</td>
<td>Natural River sand / Ultratech or equivalent approved Manufactured Sand/ Crushed Sand /As approved by Architect/BPCL.</td>
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<tr>
<td>4</td>
<td>Reinforcement Steel</td>
<td>TMT Fe 500 ISI Specification-Tata Steel / SAIL / JINDAL / VIZAG</td>
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<td>5</td>
<td>Bricks</td>
<td>Flyash Bricks / Green Building Material Bricks / As approved by Architect/BPCL.</td>
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<tr>
<td>6</td>
<td>AAC Blocks</td>
<td>Ecolite/Ultratech /Siporex</td>
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<td>RMC</td>
<td>Godrej /Ultratech/ACC</td>
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<td>8</td>
<td>Plasticizers</td>
<td>Pidilite / Chemiso / FOSROC / Sunanda / MC.</td>
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<td>Water Proofing Compound</td>
<td>Pidilite / Chemiso / FOSROC/ MC / Sunanda</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Brands/Manufacturers</td>
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<td>10</td>
<td>Flush door</td>
<td>Anchor / Century / Greenply /Samrat</td>
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<td>11</td>
<td>Door Frames</td>
<td>As approved by Architect-PMC/BPCL.</td>
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<td>12</td>
<td>Locks &amp; Keys</td>
<td>Godrej/Link/Euro</td>
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<td>Aluminium Section</td>
<td>Jindal / Hindalco / Superfine.</td>
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<td>Adhesives</td>
<td>Araldite/ Pidilite / Vermicil</td>
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<td>15</td>
<td>Ceramic Tile</td>
<td>Kajariya / Johnson / Nitco.</td>
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<td>16</td>
<td>Vitrified Tiles</td>
<td>Kajariya / Johnson / Nitco.</td>
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<tr>
<td>17</td>
<td>Internal paint</td>
<td>Asian / Nerolac / Berger/ICI</td>
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<td>18</td>
<td>Synthetic Enamel Paint</td>
<td>Asian / Nerolac / Berger/ICI</td>
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<td>19</td>
<td>External Waterproof Paint</td>
<td>Asian / Pidilite /Nerolac</td>
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<tr>
<td>20</td>
<td>Glass</td>
<td>Saint Gobian/ Modi/ Asahi</td>
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<tr>
<td>21</td>
<td>FRP Doors</td>
<td>Advance FRP or as approved equivalent by Architect/BPCL.</td>
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<tr>
<td>22</td>
<td>Lamination sheets’ one piece</td>
<td>Century/Samrat/Greenply/Anchor</td>
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<tr>
<td>23</td>
<td>Plywood</td>
<td>Century/Samrat/Greenply/Anchor</td>
</tr>
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<td>24</td>
<td>Hardware Fittings</td>
<td>Palladium/Enox/Godrej</td>
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<tr>
<td>25</td>
<td>GRC Works</td>
<td>Sanderson Group/GRC India/approved equivalent</td>
</tr>
</tbody>
</table>
PLUMBING ( DRAINAGE, WATER SUPPLY)

1. GENERAL:

1.1 The scope of work under this shall cover Plumbing (External & Internal Drainage, Internal & External Water Supply) works.

1.2 The contractor shall set out the drainage, soil, waste and water pipe lines and other fittings and fixtures in accordance with the plans and instructions of the Architect-PMC/BPCL. The contractor shall be responsible for the correctness of the above and any inaccuracies are to be rectified at his own expense as stated in the conditions of Contract. Also, contractor shall be responsible for taking level of site before setting out and putting them on record without extra charge.

1.3 The contractor should note that the major work should be executed and completed ahead of the completion of the general building work and the contractor shall take care to see that no damage or breakage is done to work once it is constructed and finished. The sanitary and water supply work shall be programmed in such a way that it does not hold up the general construction or works of other trades.

1.4 Contractor shall ensure that all the sleeves required at the time of casting of water tank, over head tank and any other sleeves required for Plumbing purpose shall be provided as per the drawings.

1.5 Chasing of walls for concealing of plumbing pipes shall be done by cutter only.

1.6 All debris emanating out of the plumbing work shall be removed from the toilets and dumped at a designated dumping place within the building premises or outside as specified.

1.7 Scaffolding if required for plumbing work shall be provided by contractor at no extra cost.

1.8 All temporary water lines required for the civil activity shall be done by contractor at no extra cost.

1.9 Contractor shall insert all the necessary sleeves as if indicated in the drawings fabricated out of G.I. ‘B’ class pipe in all the beams at the time of casting of the slab and the beams of the toilet areas at no extra cost. Also, all the sleeves required for the underground and Over Head Tanks shall be provided by the contractor at no extra cost.

1.10 All sanitary installations, water supply and drainage work shall confirm to the prevailing local Municipal Bye-laws and/or rules and regulations of Local Bodies and the works shall be got inspected and approved by the various authorities having jurisdiction.

1.11 The work shall be carried out through a licensed Plumber.
1.12 The rates quoted shall be for complete items as fixed in position and cover all costs of materials, labour, tools supervision cutting of holes, chases overheads/profits etc., and also for providing fixing arrangements viz. clamps, brackets, wooden blocks etc. The rates shall also include restoration of the original condition of all damage to walls, floors, etc. during the process of fixing a sanitary installations, water supply and drainage. All debris of plumber’s excavation etc. shall be removed without any extra charge. The plumbing work or the other building work affected by the plumber’s work shall be left thoroughly cleaned to the satisfaction of the Architect-PMC/BPCL in approved manner.

1.13 All C.I. Pipes, brackets, CPVC/G.I. Pipes and fixtures, M.S. Fixtures, shall be painted. All painting works shall be carried out to the entire satisfaction of the Architect-PMC/BPCL. If directed, additional coats of paint shall be applied to get uniform and matching finish without any extra cost.

1.14 In the interior of the building, all pipes whether of cast iron or G.I. shall be embedded in an approved manner in chase made in walls or floors if required by the Architect-PMC/BPCL. The plumbers shall make all necessary holes in the walls of masonry and concrete etc. and restore them to the original condition.

i) No tampering of waterproofing

ii) Prior permission for making holes in concrete

1.15 All water supply and sanitary fixtures, pipes and pipe fittings traps etc. which are to be embedded into the concrete or masonry work or other building work shall be placed in position and embedded or concealed at the time of casting concrete, masonry or other structural construction work. If unavoidable, space for the locations of such fittings, pipe lines and traps etc. shall be marked suitably and the cuttings, chasing or disturbing of the construction work shall proceed only after due approval of the Architect-PMC/BPCL.

1.16 All cuttings, chasing and fixing work concealing work, shall be completed before commencement of any plastering tiling or finishing work.

1.17 The contractor shall be responsible for the adequacy and efficiency of the entire system and if, in his opinion he finds any serious objection to the system shown on the drawings, he shall set forth his objections or his suggestions to ensure adequacy and efficiency of the said system and notify the Architect-PMC/BPCL before proceedings with the work.

1.18 The work in every respect during its progress and till its final acceptance by the Architect-PMC/BPCL, including raw material delivered to be incorporated for use in construction of the work by the BPCL shall be under charge and in the care of and under the responsibility of the contractor and at his risk. Any loss or damage to such materials or work prior to final acceptance of the work by the Architect-PMC/BPCL shall immediately be replaced by the
2. **DRAWINGS:**

   The drawings and accompanying specifications are design drawings, and generally are diagrammatic. They do not show every offset, bends, elbows or junction box which may be required for installation, in the space provided. The contractor shall follow the drawings as closely as in practical to do so and shall install additional bends, offsets and junction boxes where required by local conditions, subject to approval and without additional cost to the BPCL. The Architect-PMC/BPCL reserves the right to make any change in outlet location prior while executing the works. It shall be the contractor’s responsibility to provide complete system as indicated and as required by applicable codes. All connections and appurtenances shown on the various diagrams shall be included in the finished jobs. The contractor shall visit the site prior to bidding to familiarize himself with all physical conditions at the site.

3. **DIMENSIONS:**

   Figured dimensions shall in all cases be accepted in preference to scaled sizes. Large scale details take precedence over small scale drawings. In case of any discrepancies the contractor shall ask for clarifications from the Architect-PMC/BPCL before proceeding with the work.

4. **SHOP DRAWINGS & AS BUILT DRAWINGS:**

   Contractor shall prepare Shop drawings indicating the layout, Specifications of pipes fittings, levels, and all other information required for execution of work. The Shop drawings shall be got approved before carrying out any section of work. The Shop drawings shall be submitted 7 days in advance for approval from the Architect-PMC/BPCL.

   On completion of work, contractor shall submit 5 copies of drawings and one CD of the same Drawings, indicating all works with size, level, and other information duly certified by the Architect-PMC to the BPCL.

   Contractor shall also submit all operations and maintenance manual along with list of spare parts to the BPCL.

5. **TESTING AND TEST RECORDS:**

   The contractor shall test the respective system as described to establish whether the installation has been carried out to facilitate efficient operation. Each component of the work shall be tested independently at various intervals and at completion. Where the situation calls for sectional testing (e.g. before embedding any piping within the building structure or before covering up pipes laid in trenches), the contractor shall promptly arrange such testing. All testing shall be done in the presence of Architect-PMC/BPCL representative and at intervals as desired by them. The contractor shall record all testing done by him in a 'Log Book' of approved form. The test results
shall be countersigned by the representatives of both the Contractor and Architect-PMC/BPCL. The contractor shall arrange for all facilities, labour, materials, kit and instruments required for testing. All expenses thereof shall be borne by the contractor.

Contractor will have to obtain necessary sewerage drainage approvals, Storm Water Drainage approvals, layout scheme approved, ‘P’ forms, water connection, D.C.C. etc. & all other approvals and compliances from various statutory departments as required and no extra would be paid for the same

6. SPECIFICATIONS SCHEDULE OF MATERIAL

6.1 Materials:

Unless specifically mentioned otherwise all the applicable codes and standards updated and in force published by the Bureau of Indian Standards (BIS) and its subsequent revision and all other standards which may be published by them before construction work starts, shall govern in respect of design, workmanship, quality and properties of materials and method of testing for Plumbing, Drainage and Water Supply.

(All materials shall conform and bear stamps of the required Indian Standard specifications).

<table>
<thead>
<tr>
<th>IS Code</th>
<th>Specification</th>
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<tbody>
<tr>
<td>IS :781 - 1978</td>
<td>Specification for sand cast brass screw down bib taps and stop for water services.</td>
</tr>
<tr>
<td>IS :782 - 1983</td>
<td>Specification for caulking lead</td>
</tr>
<tr>
<td>IS :1172 - 1971</td>
<td>Basic requirement of water supply drainage and sanitation.</td>
</tr>
<tr>
<td>IS :1703 - 1977</td>
<td>Specification for ball valves (horizontal plunger type) including floats for water supply purpose.</td>
</tr>
<tr>
<td>IS :1879 - 1975</td>
<td>G.I. Fittings</td>
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<tr>
<td>IS</td>
<td>Description</td>
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<tr>
<td>IS: BS - 5155</td>
<td>Specification for (Butterfly) Valves for various purposes.</td>
</tr>
<tr>
<td>IS : 1729 - 1979</td>
<td>Specification for cast iron spigot and socket, soil, waste pipes, fittings and accessories.</td>
</tr>
<tr>
<td>ASTM – D – 1785</td>
<td>Specification for High Pressure UPVC Pipes</td>
</tr>
</tbody>
</table>

6.2 It shall be obligatory for the contractor to furnish certificate, from manufacturers or material suppliers, that the work has been carried out by using their material and installed/fixed as per their recommendations.

6.3 All the materials to be used to be quality as mentioned in concrete work section.

6.4 Bricks: Bricks shall be best quality, obtainable and shall be table moulded, well burnt, but not over burnt and shall be free from cracks, chips, flaws and stones. It shall not absorb water more than 20% of its own weight when dry.

6.5 Cement Mortar: Shall be of the proportion specified in the particular item in the schedule of quantities. Sand shall be measured in suitable measuring boxes and correct quantity of cement shall be added. The materials are mixed dry on a clean platform; clean water is then added and mixed thoroughly. It shall be prepared in such quantity as can be readily used up. Mortar which has partially set shall under no circumstances be re-tempered by mixing with additional cement / materials or water but shall be removed from site.

6.6 Cement Concrete: P.C.C. shall be of the proportion specified in the particular item in the schedule of quantities. Sand and Metal shall be measured in suitable measuring boxes and correct quantity of cement shall be added. The material shall be mixed dry on a clean platform.
Clean water is then added, and mixed thoroughly. It shall be prepared in such quantity as can be readily used up. P.C.C. which has partially set shall under no circumstances be used and shall be removed away from the site.

6.7 M.S.Brackets/Hangers: All M.S. Brackets/Hangers for supports of C.I. / G.I. Pipes shall be fabricated out of Mild Steel sections such as channels, angles, tees, flats etc. as per drawings or as suitable as per I.S. Code. The welding shall show evenness of ripples or waves and well formed beads with good fusion along the edges of welds. There should be no unfilled cavities, small pockets of slags or burned metal air or gas pockets.

6.8 M.S.Brackets/Hangers shall be thoroughly cleaned by wire brush to make the surface clear from any rust before application of paint. The Brackets/Hangers shall be fixed to the ceiling either by hooking or by Anchor dash fasteners as directed by the Architect-PMC/BPCL. In case the Brackets cannot be fixed by above methods, due to site condition, they shall be grouted with the permission and as directed by Architect-PMC/BPCL.

6.9 Pipe Hangers Brackets etc.: Sturdy hangers, brackets and saddles of approved design shall be installed to support all pipe lengths which are not embedded, over their entire run. The hangers and brackets shall be of adjustable heights and primer coated with Zinc Chromate primer. Clamps, collars and saddles to hold pipes shall be provided with nuts, bolts and suitable gaskets. The brackets and hangers shall be designed to carry the weight of pipes safely and without excessive deflections.

All pipes and fittings shall be supported near every joint change of direction, or to a maximum of 3 M run of pipe, unless otherwise specified. Where called for, pipe hangers shall also be supplied with proper sound and vibration dampening devices to minimize noise and vibration transmission.

7. EXTERNAL DRAINAGE

7.1 Excavation:

Excavation for underground Drainage: (For R.C.C. Pipes class NP2 and cast iron `LA' class pipes. S.W. pipes, manholes, chambers and wherever required).

Trenches for the pipes shall be excavated to correct alignment and levels as directed. The bed of the trench shall be truly and evenly dressed throughout from one change of grade to the next. The gradient is to be set out by means of boning rods and should them required depth be exceeded at any point, the extra depth shall be refilled by means of P.C.C.1:3:6 a contractor's own expense.

The bed of the trench, if in soft or made up earth, shall be well watered and rammed and depression thus formed shall be made up with hard stone soling as directed by Architect-PMC/BPCL and without any extra cost. The trenches shall be excavated to 150mm below the
invert level of the pipe and the trench filled with bed concrete as directed by the Architect-PMC/BPCL.

The trench will be kept free from water. Proper dewatering and adequate shoring and shuttering shall be provided as directed without any extra cost.

The trench width in all kinds of soil shall be 600mm plus external diameter of pipe, for all depths of excavation. Beyond 1.5 meter depth shoring and shuttering as if required at site shall be provided without any extra cost. The rates quoted by the contractor for excavation for depths shall include the cost of shoring, dewatering and refilling.

7.2 Protection of existing services: All pipes, water, mains, cables, etc. met within the course of excavation shall be adequately protected and supported as directed.

7.3 Refilling: Refilling in trenches for pipes and chambers shall commence as soon as the joints and concrete have been approved and permitted. The refilling on the top and around the pipes shall be done with great care and in such a manner as will obtain the greatest amount of compactness and solidity possible. For this purpose, the earth shall be laid in regular layers of 150mm, watered and each layer rammed adequately.

All surplus earth shall be disposed off in manner as directed by the Architect-PMC/BPCL free of cost within the site or outside.

7.4 Concreting: Pipes shall be laid on a bed of 150mm concrete with one part of cement, three parts of sand and six parts of stone aggregates 40mm and down size, properly consolidated with adequate form work. Concrete shall be laid to the full width of the trench. Concrete shall be cured for a minimum of 3 days or as directed by the Architect-PMC/BPCL.

4.4 Smoke Test: Sewer drains can also be test by means of smoke. Smoke testing machine should consist of flexible rubber tubing and bellows. Smoke is made by firing only waste (brown paper or cotton waste soaked in black oil/grease) and pumped into the drain through a gully trap or through a clay plug in an inspection chamber on the down strain side. The up strain side should be kept open until smoke is seen to issue out and the openings plugged with clay. More smoke is pumped into the section of drain. All the joints should be kept open and a thorough inspection of the joints should be made to ascertain no smoke is issuing out. Any joints found to be leaking should be rectified as per the direction of the Architect-PMC/BPCL and the test to be reduce till all the joints are found to be satisfactory.

8. SOIL, WASTE, VENT AND RAIN WATER PIPING

INTERNAL & EXTERNAL DRAINAGE (UPVC PIPES)

8.1 Unplasticised P.V.C. Pipes:
U.P.V.C. Pipes for Soil, Waste and Rain Water, Planter and AC drains shall conform to I.S.13592-1992 (type - B, SWR quality) for concealed pipe within the toilet sunk portion. The jointing of the pipes shall be in solvent cement joints. All the shaft piping shall conform to I.S.13592-1992 (type - B, SWR quality). Vent Piping shall conform to I.S.13592-1992 (type - A, SWR quality). All jointing in the shaft shall be by rubber ring joints. Rubber rings shall conform to IS 5382 and fittings to BS 4515 DIN 19531 & 19534. All the fittings like tees, bends, couplers cross etc. shall conform to IS7834-1975. The joints of U.P.V.C. Pipes recommended shall be solvent cement, flanged, or threaded, joints. Pipes and fittings shall be free of any defects like cracks, etc.

8.1.1 Storage and handling of U.P.V.C. Pipes: The pipes should be given adequate support at all times. Pipes should be stored in a reasonably flat surface free from stones and sharp projection so that the pipe is supported throughout its length. In storage, pipes racks should provide continuous support and sharp corners of Metal Racks should be avoided. Socket and spigoted pipes should be stacked in layers with sockets placed at alternate ends of the stacks to avoid top sided stacks. It is recommended not to store pipe inside another pipe.

On no account pipes shall be stored in a stressed or bent condition or near the source of heat.

Pipes should not be stacked more than 1.5M high and pipes of different sizes and classes should be stacked separately.

The ends of pipes should be protected from abrasion particularly those specially prepared for jointing either by spigot or socket solvent welded joints or soldered for use with couplings.

If due to unsatisfactory storage or handling a pipe becomes kinked' the damaged portion should be cut out completely.

8.1.2 Jointing of unplasticised P.V.C. Pipes:

Methods of Jointing:

- a) Solvent Welded Joints
- b) White cement & linseed oil mixture (Connection of U.P.V.C. to Cast Iron Pipes)
- c) Screwed or threaded Joints
- d) Rubber ring joints

8.1.3 Solvent welded joints:

This technique is used with spigot and socket type joints, in which the socket is made specially to form a close, fit on the pipe end and with injection moulded/fabricated fittings. Solvent Cement of Supreme Industries Ltd. or equivalent make shall be used as per the recommendations of the manufacturers. The dust, oil, water grease etc. should be wiped out with dry clot from the surface to be coated with solvent cement. The coating of solvent cement shall be applied evenly on the inside of the fittings for full length of insertion and then on the outside of the pipe end up to the marked line and the pipe twisted to a quarter of a turn to spread the cement evenly at the same time ensuring the pipe, pushed home fully into the socket. The pipe should be pushed into the fitting socket and held for one to two minutes as otherwise the pipes comes out of the fitting.
due to slippery quality of cement and the tapering inside bore of the fitting.

The surplus cement on the pipe surfaces shall be wiped out. In most of the cases the pipe inserted should be up to the marked line and in no case shall be less than 2/5 of the diameter of the pipe and up to marked line.

When the joint is made, the remaining cement on the pipe surfaces shall be wiped off immediately without fail as the continued action of solvent cement will weaken the wall on the pipe and cause failure under pressure.

Since solvent cements are inflammable they should not be used near the naked flames. In certain cases fumes given off from cement may be a source of danger if not carried in a well ventilated area.

When not in use containers of cement should be kept closed tightly to avoid loss of solvent or entry of dirt. Cement which has gelled or hardened should be discarded and removed from the site.

8.1.4 Rubber ring Joints or 'O' ring Shrink Joints (Shaft Piping):

Unplasticized P.V.C. Pipe may be joined by employing approved rubber ring to provide the water tight seal. The ring may be housed in groove formed in a plastic or metallic housing. The rubber is compressed and makes a seal between the pipe and the housing.

U.P.V.C. Pipes to be connected to cast iron pipes shall be joined by using putty (mixture of white cement and linseed oil) as directed by Architect-PMC/BPCL and as shown in the Drawing.

8.1.5 Traps:

General: Provide traps on all fixtures connected to the waste system, except for fixtures having integral traps.

Suspended `P’ Traps Inside Building: Provide heavy C.I. sealed gully traps, with single or double inlet as shown. Provide cast iron sealed cover for each trap secured with threaded gun metal bolts and felt gaskets of size 150mm square.

8.1.6 Fixing to Supports:

The pipes and fittings before being laid or fixed shall be examined to see that there are no cracks or defects. The pipes and fittings shall be thoroughly cleaned of all dust and dirt. After laying or fixing the pipes in position they shall be arranged in such a way that centre line of pipes coincide with the centre line of the alignment. Fittings, cleanout and floor drains shall also be laid in their position as stated above. U.P.V.C. Pipes shall be fixed vertically in shaft by means of U.P.V.C. clips anchored to walls using P.V.C. washers, G.I. Screws and Fiber Glass Plugs. In case of pipes laid horizontally, pipes shall be supported on G.I. Brackets/Hangers of approved design.

All pipes laid shall have its open ends securely closed with wooden plugs during progress of work.
Pipes and fittings shall be fixed by using proper approved holder bat clamps and special hangers. The pipes shall be fixed perfectly vertical or in a line as directed or as shown in the drawings. The vertical pipes shall have supporting Clamps at 1.5 Meter c/c and pipes laid horizontally, at every 1 - 2 Meter c/c as shown in the Drawing or as directed. Vertical spacers shall be fixed after the first coat of plaster.

8.1.7 Testing:

All U.P.V.C. Soil, Waste, Vent, Antisyphonage and Fittings shall be tested by smoke test and left in working order after completion. The smoke test shall be carried out as stated below: Smoke shall be pumped into the Drain pipes at the lowest level from a smoke machine which consists of a bellow and a burner.

The materials usually burnt are greasy cotton waste which forms clear pungent smoke which is easily detectable by sight as well as by smell if leaking at any point of the drain. During testing if any joint is found leaking the same shall be rectified by the Contractor at no extra cost & to the satisfaction of the Architect-PMC/BPCL.

9. EXTERNAL & INTERNAL WATER SUPPLY

9.1 Hot Water Pipe Insulation

9.1.1 Technical Specifications for Hot Water Pipe Insulation (Concealed)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation Material</td>
<td>K-flex</td>
</tr>
<tr>
<td>Density</td>
<td>60-90 Kgs/M³</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>0.034 W/M²K at 10°C mean temperature.</td>
</tr>
<tr>
<td>Water Vapor Resistance Factor</td>
<td>To be more than 5300.</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-60°C to 100°C</td>
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<tr>
<td>Hot Water Temperature</td>
<td>65°C</td>
</tr>
<tr>
<td>Ambient Temperature - Summer</td>
<td>40°C</td>
</tr>
<tr>
<td>Ambient Temperature - Winter</td>
<td>20°C</td>
</tr>
<tr>
<td>Relative Humidity - Summer</td>
<td>85%</td>
</tr>
</tbody>
</table>
Relative Humidity - Winter : 85%

9.1.2 General Thickness Recommendations for K-Flex

For Pipes having OD upto 35mm : 6mm
For Pipes having OD from 35mm upto 75mm : 9mm
For Pipes Having OD more than 75mm : 13mm

Adhesive Recommended : Polybond V – 9
Adhesive Tape for joints : PCS 2550

9.2 Application Procedure

1. Clean the surface of the pipe to be insulated, free from dust, grease and other matter.

   Select the correct ID and thickness of the K-Flex pipe suitable for the pipe to be insulated and slit the pipe along the length using a sharp scissors. Ensure the cut is straight.

   Apply a thin coat of adhesive Polybond V- 9 on both the cut surface of the K-Flex tubing and leave it for 2-3 minutes for drying.

   Once the adhesive is dry but tacky to touch, bring both the ends of K-Flex tubing where the adhesive is applied in contact and stick them well by applying gentle pressure on both the cut ends towards each other.

   Apply the Self Adhesive Black cotton tape PCS - 2550 on both the longitudinal and the circumferential joints. Before fixing the tapes it must be ensured that all the joints are sealed properly.

2. Disinfection of Piping System and Storage Tanks

   Before commissioning the Water Supply System., the contractor shall arrange to disinfect the entire system. The water storage tanks and pipes shall first be filled with water and thoroughly flushed out. The storage tanks shall then be filled with water again and disinfecting chemicals (chlorine) are added gradually at the time of tanks being filled to ensure through mixing. Sufficient chemical shall be sued to give water a dose of 50 PPM of water.

   For any other chemical used, the proportions shall be specified by the manufacturer. When the storage tank is full, the supply shall be stopped and all the taps on the distributing pipes
are opened successively. Each tap shall be closed when the water discharged begins to smell of chlorine. The storage tank and pipe shall then remain charged at least for three hours. Finally the tank and pipes shall be thoroughly flushed out before any water is used for domestic purpose.

3. Sterilization of Main

After the pipe work has been tested and approved, but before it is coupled, it shall be sterilized with a solution of chlorine or Lime.

4. Cutting Chase in Masonry Walls

Cold and Hot water distribution pipes to fixture and equipments exposed in the bathrooms, kitchen and sanitary compartments shall be chased into walls or floors. The contractor shall be responsible for cutting all notches, chases and recesses in walls and floors. The maximum size of pipe permitted to be concealed in floor slabs shall be 40mm diameter unless otherwise approved by the Architect-PMC/BPCL.

The chases up to 7.5 x 7.5 cm shall be made in the walls for housing pipes etc. these shall be provided in correct positions as shown in the drawings or directed by the services consultants. Chases shall be made by chiseling out the masonry to proper line and depth. After the pipes etc. are fixed in chases, the chases shall be filled with cement mortar 1:2:4 or as may be specified and made flush with the masonry surface. The concrete surface shall be roughened with wire brush to provide a key for plastering.

10. VALVES AND CONTROLS:

All Valves (gate, globe, check, safety) shall be either all PVC or gun metal valves suitable for the particular services. All valves shall be of the particular duty and design called for. Valves shall either be of the screw type or flange type, with suitable flanges and non-corrosive bolts and gaskets. Tail pieces as required shall be supplied along with valves. Gate, globe and check valves shall conform to Indian Standard IS:778- 1971 (Gunmetal gate, globe and check valves for general purposes) and non-return valves to swing check type reflex (non return valves IS:5312 (Part I) 1969.

11. SANITARY FIXTURES AND FITTINGS

11.1 Sanitary Fixtures:

All glazed Vitreous china sanitary ware shall conform to Indian Standard IS: 2556. The details make and types to be provided are given in the Schedule of Items. The Vitreous China Sanitary ware shall be of first quality only. They shall be non-porous and fully vitreous, with all the visible portions perfectly glazed and should absolutely be free from hairline cracks, pin-
holes and local depressions. They shall be perfectly symmetrical, uniform and smooth. The chromium plated fittings shall match the vitreous china fixtures.

11.2 Stainless Steel Sinks:

All Stainless Steel Sinks shall be of size and shape specified. They shall be of 18/8 or 19 high grade indestructible chrome nickel steel and polished in an immaculate easy to clean finish.

11.3 Chromium plated Supply Fittings:

All Supply Fittings and accessories shall be of brass/copper, heavy chromium plated, of the make and design specified. The fittings shall be cast fittings of screw type, machined and threaded properly for fixing to the supply pipes.

The plating shall conform to Indian Standard IS:482-1968 (Electroplated coating of nickel and chromium of copper and copper alloys).

The fittings shall be supplied complete with chromium plated matching flanges wall cover plates, nuts and extension pieces of required lengths. Metallic washers where required shall also be of chromium plated brass. All bib cocks and stop cocks shall conform to Indian Standard IS:781-1967. (Bib taps and stop valves for water services). Brass screw down pillar taps to IS:1795-1961 (pillar taps for water supply purpose), and IS:1701-1960 (Mixing valves for ablutionary and domestic purposes). All fixing accessories and screws shall be similar to fittings. All washers shall conform to Indian Standard IS:4346-1967 (washers for water taps for cold water services).

11.4 Installation of Fixtures:

The fixtures and fittings shall be provided with all such accessories as are required to complete the item in satisfactory working conditions, whether specifically mentioned or not in the Schedule of Quantities, Specifications and Drawings.

The Sanitary fixtures and fittings shall be installed at the correct assigned position as shown on the drawings and as directed by the Architect-PMC/BPCL, and shall fully meet with the aesthetic and symmetrical requirements as demanded by the Architect-PMC/BPCL.

All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per Architect-PMC/BPCL requirements. Wherever necessary, the fittings shall be centered to dimensions and pattern as called for.

Fixtures shall be installed by skilled workman with appropriate tools according to the best trade practice. Manufacturer's Instructions shall be followed for the installation of fixtures. Fixtures in all toilets shall be Standard height, mounting as called for on the drawings. Fixtures shall be mounted rigid, plumb and true to alignment.
11.5 Mock UP and trial assembly:

The installation of the sanitary fixtures and fittings shall be as per the shop drawings approved by the Engineer-in-charge. The contractor shall assemble on trial basis at least one set of each type of sanitary fixture and fittings in order to determine precisely the required supply and disposal connections. Relevant instructions from manufacturers shall be followed as applicable. This trial assembly shall be developed to facilitate determining the location of punctures, holes, holding devices etc. which will be required for final installation in position of all sanitary fixtures and fittings. The above assembly shall be subject to final approval by the Architect-PMC/BPCL.

The fixtures in the trial assembly can be reused for final installation without any additional payments for fixing or dismantling of the fixtures.

11.6 Supporting and fixing devices:

The contractor shall where required, provide all supporting and fixing devices necessary to install the sanitary fixtures and fittings securely in position. The fixing devices shall be rigidly anchored into the building structure. The devices shall be rust resistant and shall be so fixed that they do not present an unsightly look in the final assembly. Where the location demands, the Architect-PMC/BPCL may instruct the Contractor to provide chromium plated or other similarly finished fixing devices. In such circumstances the contractor shall arrange to supply fixing devices. These shall be installed complete with appropriate washers and gaskets, jointing Materials and Screws etc.

11.7 Final Installation:

The Contractor shall install all sanitary fixtures and fittings in their final position in accordance with approved trial assemblies and as shown on drawings. The installation shall be complete with all supply and waste connections. The connection between built-in piping system and the sanitary fixtures shall be through proper unions and flanged to facilitate removal/replacement of sanitary fixtures without disturbing the built in piping fixtures without disturbing the built in piping system. All unions and flanges shall match in appearance with other exposed fittings.

Fixtures shall be mounted rigid, plumb and true to alignment. The outlets of water closet pans and similar appliances shall be examined to ensure that outlet ends are butting on the receiving pipes before making the joints. It shall be ensured that the receiving pipes are clear of obstruction. When fixtures are being mounted, attention shall be paid to the possibility of movement and settlement by other causes. Overflows shall be arranged as to give visible warning and discharge. A check shall be made to ensure that necessary anchoring devices have been provided for supporting water closets, wash basins, sinks and other appliances.
11.8 Protection against Damage and Theft:

The contractor shall take every precaution to protect all sanitary fixtures against damage, misuse, crazing, staining, breakage and pilferage by providing proper wrapping and locking arrangement till the completion and handing over of the installation. At the time of handing over, the contractor shall clean, disinfect and polish all fixtures and fittings. Any fixtures and fittings found damaged, cracked, chipped, stained or scratched shall be removed and new fixtures and fittings free from defects shall be installed at his own cost to complete the work.

11.9 Testing:

All fixtures and fittings shall be tested for their proper performance by the Contractor thoroughly to satisfy himself that they are in order, before applying for virtual completion.

12. MISCELLANEOUS WORK

12.1 Identification Colour Code:

All piping systems shall be suitably painted or otherwise colour identified according to Appendix - E - Identification of pipes of IS:2065-1972 (code of practice for water supply in buildings). The identification colours and letter symbols for various services shall be as follows:

<table>
<thead>
<tr>
<th>Service</th>
<th>Identification Colour</th>
<th>Letter Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Soil, Waste piping</td>
<td>Black</td>
<td>S</td>
</tr>
<tr>
<td>2. Water Supply Lines</td>
<td>Sea Green</td>
<td>CW</td>
</tr>
</tbody>
</table>

The letter symbols shall either be legibly painted or affixed in an appropriate manner to be read conveniently. At locations where painting cannot be done, the piping system shall be identified by fastening self adhesive PVC tapes of appropriate colour in an approved manner. The tapes varying in 50mm to 15mm wide strips depending on the size of pipe on which the tapes are fastened shall be applied at regular intervals on continuous runs and at all bends, junctions and tees.

12.2 Painting:

The Contractor shall supply all materials, labour tools and other equipment necessary for carrying out painting work. Painting as described herein shall be applied to all surfaces requiring painting. Paint materials used in the work shall be of approved make of ready mixed variety supplied to site in manufacturer’s original containers. Thinning where necessary shall only be done as per manufacturer’s instructions. All surfaces to be painted shall be cleaned free of all dirt and dust before painting is started. Painting shall only be started after the receiving surfaces are in a condition fit to receive painting as certified by the Architect-PMC/BPCL. Properly qualified foreman and skilled experienced painters shall be employed to painting work.
12.3 Preparation of Surfaces:

All steel and iron surfaces to be painted shall be washed with mineral spirits to remove all dirt and grease. Where rust or scale is present, the surfaces shall be wire brushed to remove such rust. The cleaned surfaces shall be given one coat of approved phosphate before priming coat is applied.

All galvanized metal to be painted shall be thoroughly cleaned with napthalene and treated with a solution of 5 gallons of 36% acetic acid, 1.36 kg. of blue vitriol and 1.36 kg. of powered alum dissolved in 225 litres of water.

12.4 Painting Finishes:

The Painting Finishes shall consist of the operations briefly mentioned below:

All cast iron soil, waste vent pipes, manhole covers, gratings and frames shall be painted with three coats of bitumastic paint.

All cast iron water mains pipes shall be painted with one coat Zinc Chromate primer followed by three coats of synthetic enamel paint.

All non-galvanized steel surfaces shall be painted with one coat of Zinc Chromate primer followed by three coats of synthetic enamel paint.

All galvanized surfaces shall be prime coated with galvanized metal primer after washing with galvanized metal cleaner. The surfaces shall then be painted with three coats of synthetic enamel paint.

All painted finished surfaces shall be smooth throughout and retain a consistent uniform shade all through. Where in the opinion of the Architect-PMC/BPCL, the painting is not consistent in application or appearance; the painting shall be redone to his satisfaction by the contractor at his own cost.

12.5 Disinfection of Piping System:

Before commissioning the filtered water supply system the contractor shall arrange to disinfect the entire system as described in the succeeding paragraph.

The filtered water pipes shall first be filled with water and thoroughly flushed out. The storage tanks shall then be filled with water again and disinfecting chemical containing chlorine added gradually while tanks are being filled to ensure thorough mixing. Sufficient chemical shall be used to give the water a dose of 50 parts of chlorine to one million parts of water. If ordinary bleaching powder is used, the proportions will be mixed with water in the storage tank. If a
proprietary brand of chemical is used, the proportions shall be as specified by the makers. When the storage tank is full, the supply shall be stopped and all the taps on the distributing pipes opened successively working progressively away from storage tank. Each tap shall be closed when the water discharge begins to smell of chlorine. The storage tank shall then be filled up with water from supply pipe and added with more disinfecting chemical in the recommended proportions. The storage tank and pipe shall then remain charged at least for three hours. Finally the tank and pipes shall be thoroughly flushed out before any water is used for domestic purposes.

12.6 Connections to Mechanical Equipment supplied by other agencies:

All inlets, outlets, valves, piping and other incidental work connected with installation of all Mechanical equipment supplied by other agencies shall be carried out by the Contractor in accordance with the Drawings, requirements for proper performance of equipment manufacturer’s instructions, and the directions of the Architect-PMC/BPCL.

The equipments to be supplied by the other agencies consist mainly of Water Treatment, Pumps and Equipment, (Hydropneumatic System). The connections to the various equipments shall be effected through proper union and isolating valves. The work of effecting connections shall be executed in Consultation with and according to the requirements of equipment suppliers, under the directions of the Construction. The various aspects of connection work shall be executed in a manner similar to the work of respective trades mentioned elsewhere in the specification.

12.7 Connections to R.C.C. Water Tanks:

The Contractor shall provide all inlets, outlets, washouts, vents, overflow and all such other piping connections to Water Storage Tanks as called for as pipe embedment’s indicated in the Drawings.

12.8 Safety Code:

1. First aid appliance shall be maintained in a readily accessible place including adequate supply of sterilised dressings and cotton wool.

2. An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.

3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from ground.

4. No portable single ladder shall be over 8 metres in length. The width between the side rails shall not be less than 30 cm. (clear) and the distance between two adjacent rungs shall not be more than 30 cms. When a ladder is used an extra mazdoor shall be engaged for holding the
5. The excavated materials shall not be placed within 1.5 metres of the edge of the trench or half of the dept of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.

6. Every opening in the floor of a building or in working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one metre.

7. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.

8. Workers employed on mixing and handling material such as asphalt, cement mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand gloves.

9. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.

10. (i) No point containing lead or lead products shall be used except in the form of paste or readymade paints.

(ii) Suitable face marks should be supplied for use by the workers when the paint is applied in the form of spray or surface having lead paint dry rubbed and scraped.

11. Overalls shall be supplied by the Contractor to the painter and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.

12. Hoisting machines and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.

13. The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from defects.
### MAKE OF EQUIPMENT & APPROVED MANUFACTURERS OR APPROVED EQUIVALENT

1. **SWR Pipes and Fittings**
   - a. Astral SWR Piping System
   - b. Ajay
   - c. Prince Ultra Fit

2. **G.I. ERW quality**
   - a. Jindal
   - b. Zenith

3. **G.I. fittings**
   - a. ZOLOTO “M”
   - b. Kirti

4. **Cast Iron Pipe**
   - a. Neco
   - b. Kapilansh

5. **CPVC/UPVC**
   - a. Astral
   - b. Ajay
   - c. Supreme

6. **S.W. Pipes**
   - a. Rajura
   - b. Sonya

7. **Ball Valves**
   - a. Zoloto
   - b. Itab

8. **Paint**
   - a. Asian Paints
   - b. Shalimar

9. **D.I Manhole Cover & Gratings**
   - a. Neco
   - b. Kapilansh

10. **Automatic Air Release Valve**
    - a. Varie
    - b. Itab

11. **Floor Traps**
    - a. Neco

12. **Pressure Reducing Valve**
    - a. Honeywell
    - b. Varie

13. **Strainer**
    - a. Varie
    - b. Lehry

14. **Pumps**
    - a. Grundfoss
<table>
<thead>
<tr>
<th></th>
<th>Hot Water Insulation</th>
<th></th>
<th>C.P. Fittings &amp; Accessories</th>
<th></th>
<th>Vitreous China Sanitary ware</th>
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<tbody>
<tr>
<td></td>
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<td>b.</td>
<td>Armaflex</td>
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<td>b. Parryware</td>
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<td>16</td>
<td></td>
<td>a.</td>
<td>Jaquar</td>
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<tr>
<td>17</td>
<td></td>
<td>a.</td>
<td>Hindware</td>
<td>b.</td>
<td>Parryware</td>
</tr>
</tbody>
</table>

b. Wilo
c. DP
d. Kirloskar
FIRE HYDRANT, SPRINKLER & DRENCHER SYSTEM

1. GENERAL:

1.1 The scope of work under this shall covers Fire Fighting & Sprinkler System

1.2 The contractor shall set out the fire water pipe lines and other fittings and fixtures in accordance with the plans and instructions of the Architect-PMC/BPCL. The contractor shall be responsible for the correctness of the above and any inaccuracies are to be rectified at his own expense as stated in the conditions of Contract. Also, Contractor shall be responsible for taking level of site before setting out and putting them on record without extra charge.

1.3 Contractor shall ensure that all the sleeves required for fire fighting lines at the time of casting of water tank, over head tank and any other sleeves required for Fire fighting purpose shall be provided as per the drawings.

1.4 All debris emanating out of the fire fighting work shall be removed from the site and dumped at a designated dumping place within the building premises or outside as specified.

1.5 Core cutting in RCC members as per RCC Consultants approval if any shall be the Contractors responsibility and shall be made good at no extra cost.

1.6 Scaffolding if required for Fire fighting works shall be provided by contractor at no extra cost.

1.7 Contractor shall insert all the necessary sleeves as if indicated in the drawings fabricated out of G.I. ‘B’ class pipe in all the beams at the time of casting of the slab and the beams of the other areas at no extra cost. Also, all the sleeves required for the underground and Over Head Tanks shall be provided by the contractor at no extra cost.

1.8 All fire fighting and sprinkler installations shall confirm to the prevailing Chief Fire Officer (CFO) requirements, local Municipal Bye-laws and/or rules and regulations of Local Bodies and the works shall be got inspected and approved by the various authorities having jurisdiction.

1.9 The work shall be carried out through a licensed Fire Fighting Contractor.
1.10 The rates quoted shall be for complete items as fixed in position and cover all costs of materials, labour, tools supervision cutting of holes, chases overheads/profits etc., and also for providing fixing arrangements viz. clamps, brackets, wooden blocks etc. The rates shall also include restoration of the original condition of all damage to walls, floors, etc. during the process of fixing a fire fighting piping and fixtures. All debris of excavation etc. shall be removed without any extra charge. The fire fighting work or the other building work affected by the fire fighting work shall be left thoroughly cleaned to the satisfaction of the Architect-PMC/BPCL in approved manner.

1.11 All G.I. Pipes and fixtures, M.S. Fixtures, shall be painted. All painting works shall be carried out to the entire satisfaction of the Architect-PMC/BPCL. If directed, additional coats of paint shall be applied to get uniform and matching finish without any extra cost.

1.12 In the interior of the building, all pipes whether of cast iron or G.I. shall be embedded in an approved manner in chase made in walls or floors if required by the Architect-PMC/BPCL. The plumbers shall make all necessary holes in the walls of masonry and concrete etc. and restore them to the original condition.

   i) No tampering of waterproofing

   ii) Prior permission for making holes in concrete

1.13 All cuttings, chasing and fixing work concealing work, shall be completed before commencement of any plastering tiling or finishing work.

1.14 The contractor shall be responsible for the adequacy and efficiency of the entire system and if, in his opinion he finds any serious objection to the system shown on the drawings, he shall set forth his objections or his suggestions to ensure adequacy and efficiency of the said system and notify the Architect-PMC/BPCL before proceedings with the work.

1.15 The work in every respect during its progress and till its final acceptance by the Architect-PMC/BPCL, including raw material delivered to be incorporated for use in construction of the work by the BPCL shall be under charge and in the care of and under the responsibility of the contractor and at his risk. Any loss or damage to such materials or work prior to final acceptance of the work by the Architect-PMC/BPCL shall immediately be replaced by the Contractor at his expenses

1.16 All cuttings, chasing and fixing work concealing work, shall be completed before commencement of any plastering tiling or finishing work.

2. DRAWINGS:

The drawings and accompanying specifications are design drawings, and generally are diagrammatic. They do not show every offset, bends, elbows or junction box which may be required for installation, in the space provided. The contractor shall follow the drawings as closely
as in practical to do so and shall install additional bends, offsets and junction boxes where required by local conditions, subject to approval and without additional cost to the BPCL. The Architect-PMC/BPCL reserves the right to make any change in outlet location prior while executing the works. It shall be the contractor’s responsibility to provide complete Fire fighting system as indicated and as required by CFO and applicable codes. All connections and appurtenances shown on the various diagrams shall be included in the finished jobs. The contractor shall visit the site prior to bidding to familiarize himself with all physical conditions at the site.

3. DIMENSIONS:

Figured dimensions shall in all cases be accepted in preference to scaled sizes. Large scale details take precedence over small scale drawings. In case of any discrepancies the contractor shall ask for clarifications from the Architect-PMC/BPCL before proceeding with the work.

4. SHOP DRAWINGS & AS BUILT DRAWINGS:

Contractor shall prepare Shop drawings indicating the layout, Specifications of pipes fittings, levels, and all other information required for execution of work. The Shop drawings shall be got approved before carrying out any section of work. The Shop drawings shall be submitted 7 days in advance for approval from the Architect-PMC/BPCL.

On completion of work, contractor shall submit 5 copies of drawings and one CD of the same Drawings, indicating all works with size, level, and other information duly certified by the Architect-PMC to the BPCL.

Contractor shall also submit all operations and maintenance manual along with list of spare parts to the BPCL.

5. TESTING AND TEST RECORDS:

The contractor shall test the fire fighting and sprinkler system as described to establish whether the installation has been carried out to facilitate efficient operation. Each component of the work shall be tested independently at various intervals and at completion. Where the situation calls for sectional testing (e.g. before embedding any piping within the building structure or before covering up pipes laid in trenches), the contractor shall promptly arrange such testing. All testing shall be done in the presence of Architect-PMC/BPCL representative and at intervals as desired by them. The contractor shall record all testing done by him in a 'Log Book' of approved form. The test results shall be countersigned by the representatives of both the Contractor and Architect-PMC/BPCL. The contractor shall arrange for all facilities, labour, materials, kit and instruments required for testing. All expenses thereof shall be borne by the contractor.

Contractor will have to obtain necessary approvals for the Fire Fighting works including all approvals and compliances from various statutory departments as required and no extra would be
paid for the same.

6. **APPLICABLE STANDARDS:**

6.1 Unless specifically mentioned otherwise all the applicable codes and standards updated and in force published by the Bureau of Indian Standards (BIS) and its subsequent revision and all other standards which may be published by them before construction work starts, shall govern in respect of design, workmanship, quality and properties of materials and method of testing. Some of these available standards are listed below:

(All materials shall conform and bear stamps of the required Indian Standard specifications).

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>I.S. 1239</td>
<td>Specifications for G.I. Pipes</td>
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<tr>
<td>I.S. 778</td>
<td>Specifications for Gun Metal gate, globe, and check valves for water supply.</td>
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<tr>
<td>I.S. 3589</td>
<td>Specifications for ERW black pipes for water, gas and sewage Class I.</td>
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<td>Specifications for covered electrodes for metal arc welding of structural steel.</td>
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<td>I.S 1538</td>
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</tr>
<tr>
<td>I.S. 2198</td>
<td>Control Panels</td>
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</table>

### 6.2 Materials:

All materials shall be C.F.O. approved and conform and bear stamps of the required standard specifications.

Samples of all materials shall be approved before placing order and the approved samples shall be deposited with Architect-PMC/BPCL.

If so directed, materials shall be tested in an approved testing laboratory and the Contractor shall produce the test certificate in original to the Architect-PMC/BPCL and the entire charges for original as well as repeated tests shall be borne by the Contractor. If required by the Architect-PMC/BPCL, the Contractor shall arrange to test portion of the work at his own cost in order to prove their soundness and efficiency. If after any such test, the work or portions of work is found in the opinion of the Architect-PMC/BPCL, to be defective or unsound, the contractor shall pull down and redo the same at his own cost. Defective Material shall be removed from site.

It shall be obligatory for the Contractor if so required by the Architect-PMC/BPCL to furnish certificates from manufacturers or materials suppliers, that the work has been carried out using their materials and installed/fixed as per their recommendations/factory manuals.

### 6.3 Steel Pipes:

The M.S. pipes of 200 mm dia and above shall conform to IS : 3589-1981 Class I Grade 330 with 6 mm wall thickness and 150 mm dia and less G.I shall conform to IS: 1239. (Mild Steel Pipes, Tubular and Wrought Steel) heavy class only.

### 6.4 Galvanising:

Galvanising shall conform to I.S. 2529 (Hot Dip galvanizing of iron and steel). On delivery to site, the pipes and fittings shall be inspected for the galvanised coating and shall have identification for the class of pipes. Pipes with damaged coatings shall be segregated & removed from the site and not be used in the installation.
6.5 **Welding of Pipes:**


Preparing pipe faces for welding: Before aligning, assembling and welding the pipe faces shall be cleared by scraping by wire brushes or any other method specified by the construction Manager.

The welding shall show eveness in ripples or waves and well formed beads with good fusion along the edge of weld. There shall be no unfilled cavities, small pockets of slags or burned metal air or gas pockets.

6.6 **Testing of Welded Joints:**

The welded joints shall be tested in accordance with the procedure laid down in I.S.3600,(Part I) 1973 suitable means as desired by Architect-PMC/BPCL.

6.7 **Welding of Closure Gaps:**

Final welding of closure gaps shall be carried out with in a temperature range of average air temperature +8 Degree C.

6.8 **Jointing of Pipes:**

All pipes M.S./G.I. shall be joined by means of arc welding after laying in correct position and shall have flanged joints at every 20 M straight length and at change in direction/change in size/branch connections. M.S. flanges shall conform to I.S 1538 part IV to part VI table E which shall be cut and drilled out of M.S. plates. M.S. cut flanges shall be galvanised before welding to G.I. pipes. All gaskets for flanged joints wherever required shall be of Neoprene 6mm thick with G.I. nuts and bolts. Welded joints shall be covered with a coat of epoxy paint, applied after preparation of surface and appropriate primer.

a. **Fire Fighting System:**

Pipes of all diameters shall have welded joints with flanged joints at every 20 m straight length.

b. **Sprinkler System**

Pipes of 200mm diameter and above shall have welded joints with flanged joints at every 20
Pipes of 150mm diameter and below shall have welded joints.

6.9 Inspection before Installation:

The M.S. and G.I. pipes, fittings and specials shall be inspected before delivering at the site for the brand, quality, etc. The pipe and fittings shall be inspected at the site again before laying and defects noticed, if any, such as protrusion, grooves, dents, etc. Shall be rectified. Care shall be taken that the resulting wall thickness does not become less than the minimum. Any damaged portion shall be cutout as a cylinder and replaced by an undamaged piece of pipe.

6.10 Handling of Pipes and Specials:

It is very essential to avoid damage to the pipes, fittings specials etc., at all stages during handling. The pipes & specials shall not be distorted of their circular shape and galvanising shall not be damaged. Pipes shall not be thrown down while unloading.

6.11 Laying of Pipes:

The pipes cut to required lengths shall be laid to required gradients and joined by welding or by flanged joints as called for. The laying of welded pipes shall comply to IS:5822-1986, "Code of practice for laying of welded pipes for water supply".

6.12 Testing of Pipe Line:

Field Test Pressure:

The field test pressure to be imposed shall not be less than 15 kg/cm².

Procedure of Test:

All air shall be expelled from the pipe line through hydrants and air valves. Each valved section of pipes shall then be slowly and carefully filled with water and allowed to stand full of water for a few hours if time permits. The specified test pressure based on the elevation of lowest point of the line or section under test and corrected to the elevation of the test gauge shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Architect-PMC/BPCL. Due precaution shall be taken to ensure that the required test pressure is not exceeded. Pressure gauges shall be accurate and shall preferably have been re-calibrated before the test. The test pump having been stopped, the test pressure shall maintain itself without measurable loss for at least Two hours or as directed by Architect-PMC/BPCL. The pipes shall be tested in sections as the work of laying Proceeds, and joints inspected during testing. The open end of the pipe line may be temporarily closed for testing under moderate...
pressure by fitting a water tight expanding plug. The end of the pipe and the plug shall be secured by struts or otherwise to resist the end thrust of the water pressure in the pipes.

6.13 M.S. C.I. Brackets/Hangers:

All M.S. Brackets/ Hangers for supports of M.S.,G.I. pipes and fittings shall be fabricated out of mild steel section such as channels, Angles, Tees,Flats etc., or shall be cast iron as per site conditions as per drawing or as suitable, as per I.S. Code. The brackets, hangers etc. shall be fabricated to required sizes and shapes and installed in position as shown on drawings or as required as per site conditions. The welding and other operations involved in fabrication shall be carried out as per relevant specifications and best trade practices.

M.S. Brackets/Hangers shall be thoroughly cleaned by wire brush to make the surface clear from any rust before application of paint. The brackets/Hangers shall be fixed to the ceiling by Anchor fasteners, as directed by the Architect-PMC/BPCL. In case the brackets cannot be fixed by above method due to site condition, they shall be grouted in to the slab with the permission and as directed by the Architect-PMC/BPCL.

Sturdy Hanger, Brackets and saddles of approved design shall be installed to support all pipe lengths, which are not embedded over their entire run. The hangers and brackets shall be of adjustable heights and primer coated with zinc chromate primer. Clamps, collars and saddles to hold pipes shall be provided with nuts, bolts and suitable gaskets. The brackets and hangers shall be designed to carry the weight of pipes safely and without any deflections. All pipes and fittings shall be supported at a maximum of 3 M run of pipe and at change of direction or wherever required as per site conditions. Where called for, pipe hangers shall also be supplied with proper sound and vibration dampening devices, to minimize noise and vibration transmission.

Details of piping support both for horizontal and vertical pipes are shown in the relevant drawings and shall be strictly followed by the Contractor.

Pipes of 50mm dia & less shall be fixed to the ceiling with Anchor-fastener, or M.S/'U' clamps as directed. Pipe hangers for larger dia meter i.e 65mm and above shall be as per the supporting details shown in the relevant Drg. The support consists of channel of suitable size as indicated in the drg., fixed vertically and supported from the ceiling and two 'U' clamps made from 25 x 6mm flat with bolts & nuts.

Fire water main pipes or headers shall be supported on M.S. Cradles, fabricated out of M.S. angles of suitable size and verticals made out of M.S.flat of suitable size hooked to reinforcement in slab above and pocket grouted properly.

6.14 Painting:

All M.S. exposed pipes & fittings, M.S.brackets, hangers etc shall be provided with 2 coats of
Enamel Paint over 2 coats of Zinc Chromatic primer. All G.I./C.I pipes fittings/valves etc. shall be painted with 3 coats of enamel paint over one coat of Zinc Chromate primer or as directed. All paint work shall be carried out as per standard specifications.

6.15 Valves and Controls:

All valves shall be C.I butterfly slimseal type (AUDCO make as per B.S. 5155).

6.16 C.I. Non Return Valves:

The non-return valve shall be double flanged cast iron of approved make. Re coil check valve with cast iron body with all internals made of Gun Metal or Wafer Type Check Valve.

6.17 Orifice Plates:

These shall be specially designed orifice plates wherever required on hydrant outlets of suitable size for adjustment of delivery pressure, where running pressure exceeds 7 kg/cm².

6.18 Hydrant Valves:

Hydrant valves shall be as per I.S. 5290. The outlets size shall be 63mm dia. The hydrant valves shall be Gun Metal morris pattern approved by Fire Brigade with necessary nuts, bolts,& gaskets etc. The valve shall be right angled, turn down and other types having instantaneous female plunger type 63mm outlets with chained blank cap. flanged inlets gunmetal or light alloy with C.I. or brass hand wheels tested to 21 kg/cm² pressure. The valves shall be either single outlet or Double outlet as required and as shown in the drawing.

6.19 Hose Boxes:

Mild Steel Hose cabinet of size shall be as indicated in the drg. capable of accommodating twin outlet hydrant valves Fire hose, and first Aid hose reel with locking arrangement and lever for opening the door after breaking glass. Each hose box to be fitted with glass door in front, painted ‘fire’ in red paint. Cabinet shall be painted with two coats of enamel paint over two coats of Zinc Chromate primer. These boxes shall be provided at locations show in the Drg.

6.20 First Aid Hose Reel:

Hose Reels shall be Swinging wall mounting type complete with 20mm dia x 30 Mt. long armoured rubber hose (Dunlop make) with nozzle and cutoff valve attachment. Hose reel shall be of surging type wall mounted drum.
6.21 Fire Brigade Connection:

Fire Brigade (Siamese) inlet connection with 4 (four) connecting points of 63mm size male inlet connections, fabricated out of G.I. Pipes and incorporating a C.I. non return valve for fire and sprinkler system. The fire brigade connection shall be connected to the 1) Fire storage tank 2) Fire wet riser system 3) Sprinkler system at locations shown in the drawings.

6.22 Sprinklers:

Sprinklers shall be `GRINNEL / AUTOMATIC' Type FUNDER WRITERS LABORATORY / Factory mutual’s listed or approved equivalent and approved by CFO. The bulb shall be quartzoid bulb with a temperature rating of 68 deg.C. The sprinklers shall be pendant type / Side Wall / Recessed type as called for.

The Orifice size shall be 15 mm with Gun Metal Body, Bronze finish and quartzoid bulb as heat sensitive element and universal deflector all as approved by CFO & UL/FML listed. The discharge pattern for pendant sprinklers shall be spheroidal covering an area of 9 sq.meters. Sprinklers shall be mounted up right/ suspended in pendant position, shown in the drawings.

6.23 Installation Control Valve:

Installation Control valves shall be approved by CFO and shall be wet type, flanged of suitable size as shown in the drawing with cast iron body, Bronze seating Alarm valve clack, Drain and test valve, pressure gauge on upstream and downstream and water motor gong to be automatically operated on loss of pressure in the system. The water motor gong shall be pelton wheel type or electric alarm.

6.24 Court Yard Hydrant:

The Court Yard Hydrant landing valve shall be as per I.S. 5290. The valve shall be a single outlet oblique type hydrant valve with instantaneous coupling Gun Metal Body and hand wheel to be fixed on a stand pipe of 80mm dia.

6.25 Hose Pipe for Court Yard Hydrant:

Fire hose shall be synthetic, jacketed type with unified lining and cover of special polymer compound designed to resist impact, abrasion, damage, weathering by ozone, burning oils and chemicals. It shall conform to IS: 636 type B of 63 mm dia, 15 m long with instantaneous couplings (Male & Female) screwed, with 16 gauge G.I. wire on either ends.

6.26 Branch Pipes:

Branch pipe shall be as per IS-903 long type with copper body with Male inlet and screwed
6.27 Pressure gauge:

The pressure gauges shall be of 'BOURDEN TYPE' with +/- 1% accuracy. The size or diameter of the dial shall be 150mm with a pressure range from 0 to 16 kg./sq.cm with 15mm connection. The measuring element type shall be `BOURDEN' and material shall be SS-316.

6.28 AUTOMATIC SPRINKLER AND FIRE ALARM INSTALLATION (WET SYSTEM):

Installation Control Valves shall be approved by C.F.O. and shall be wet type, flanged of required size with C.I. body, bronze seating alarm valve clack, drain and test valve, pressure gauge on upstream and downstream and water motor gong to be automatically operated on loss of pressure in piping. The water motor gong shall be pelton wheel type or electric alarm.

a. Stop Valve:

The valve shall be of wedge type and be provided with an indicator showing the valve in open or closed position. It shall be secured in the open position by a padlock and strap. This valve controls the water supply to installation and must always remain open.

b. Alarm equipment:

The Alarm equipment to be provided shall give a loud alarm in case of fire. This equipment shall come into operation when water flows through the installation valves to sprinkler when opened due to fire. The equipment shall consist of simple and positive action main parts namely i) Alarm valve, ii) Alarm Stop Valve iii) Alarm Motor and Gong.

b.1 Alarm Valve:

Alarm valve shall have a cast iron body & be fitted with a Bronze seating and valve guide clack resting on the bronze seating. The flat circular Bronze plate of the clack shall be faced with a special composition disc, and shall rest on the seating and prevent access of water to the groove. When water flows into the installation, clack shall lift and water shall flow through groove and open alarm stop valve to the alarm motor.

b.2 Alarm Stop Valve:

Alarm stop valve shall have an indicator to show whether it is open or closed. Alarm stop valve shall control the flow of water from Alarm valve through annular groove to the alarm motor. It should have a strap to keep the valve in open position to give alarm when the fire takes place.

b.3 Alarm Motor and Gong:
The Alarm Motor shall be of pelton wheel type. The whole unit shall be simple and robust construction and shall give a reliable service. Suitable Drain pipe shall be provided to discharge water through drip plug with an orifice to restrict the rate of discharge. This shall not impair the operation of Alarm motor and gong.

c. Drain and Test Valve:

The drain pipe size shall be 50mm dia. The test valve shall have to be in closed position secured by a strap. 15mm dia size test valve shall be provided to test the Alarm when the test valve is opened, water shall flow through Alarm valve, lift alarm valve clack from its seat and allow water to flow to the Alarm Motor. Valve shall be in closed position when not in operation and shall be secured with the strap.

d. Sprinklers for testing.

The Contractor shall provide free of cost to the Owner Sprinkler heads for testing purposes. The test shall be carried out on the sprinklers separate for each zone.

6.29 Examination under Pressure

Under the test pressure no leak or sweating shall be visible at all section of pipes, fittings, valves, Hydrants & welded joints. Any defective workmanship and defective pipes, fittings, valves or Hydrants discovered in consequence of this pressure test shall be removed and replaced with acceptable material & the test shall be repeated until found satisfactory by the Architect-PMC/BPCL.

7. MISCELLANEOUS:

7.1 Tools, Materials & Storage:

a. The contractor at his own cost shall provide all materials, tools, testing, materials, scaffolding labour and electric power, necessary for the perfect completion of the whole work.

b. The contractor shall pay the fees for testing the materials if directed by the Architect-PMC/BPCL and local Authorities or other statutory authorities.

c. The contractor shall obtain from time to time various permissions and the completion certificates as per rules of all local and statutory authorities.

d. The contractor shall arrange for the materials and storage facility.

e. Any materials, brought at site shall not be removed without the written authority of the Architect-PMC/BPCL and when the contractor shall have received payment in respect of any certificate in which it is stated that the value of any unified materials, on the work has
been taken into account, such materials shall become the property of the employer and the contractor shall be liable for any loss or damage hereto.

f. All the brackets and hangers for pipes shall be fixed to the wall or R.C.C. slab using Anchor fasteners, wherever necessary.

h. Surplus material from the site shall be carried away by the contractor without any cost to the BPCL and the storage space provided to the contractor shall be handed over to the BPCL clear and ready occupation.

7.2 Testing:

The contractor shall be required at his own expense to test the installation with water. The minimum test pressure shall be 50% higher than the system pressure. Pressure shall be 50% higher than the system pressure. When the installation is completely carried out, proper stoppers, screws, plugs, hose, etc. must be provided for this purpose. If required, these shall be taken out and re-laid at the contractor’s expense. The required quantity of water for testing will be provided by the contractors. The installation shall be guaranteed against faulty material, workmanship and design. The defect liability period is for 12 months and design and the period commences from the date of commissioning of the whole installation along with the approved certificate from the authorities. During this period the contractor shall be responsible for any repairs or replacement of any defective part and shall rectify the installation free of cost to the BPCL.

The contractor shall train the BPCL personnel for the proper maintenance of the installation.

The contractor shall supply free of cost 2 sets of final installation drawings and operating manual to the owner.

8. Some of the important and major points of CFO NOC area as follows. Contractor to follow the below mentioned points strictly in accordance with CFO. However, if tender items are of higher degree or standards than the below mentioned points, then tender items should be followed.

1. All the structural steel members i.e. columns, beams, etc., shall be protected with the 02 hours fire resisting materials and methods as stipulated under IS 1942-1960 as application for residential building.

2. The entire open spaces shall be sufficiently hardened to bear the weight of fire engine weighing up to 48 M.T. each with a point load of 10 kgs/sq.cm.

3. The terrace door shall be provided in the following manner:-
   A. The single latch lock shall be installed from the terrace side at the height of not more than one mtr.
B. The glass front of 6 inch diameter with the breakable glass shall be provided just above the single latch lock, so as to open the latch in case of an emergency by breaking glass.

C. The door shall either be fitted with magnetic lock or shall be synchronize with fire detection and alarm system.

4. Self glowing / fluorescent exit signs in green color shall be provided showing the means of escape for entire building on each floor.

5. Portable lights / insta lights shall be provided at strategic locations in the staircase and lift lobby.

6. The staircase and corridor lighting shall be on separate circuits and shall be independently connected so that they could be operated by one switch installation on the ground floor easily accessible to fire fighting staff at any time irrespective of the position of the individual control of the light points, if any.
   I. Staircase and corridor lighting shall also be connected to alternate supply.
   II. Double throw switches should be installed to ensure that lighting in the staircase and the corridor do not get connected to two sources of supply simultaneously. A double throw switch shall be installed in the service room to terminate the stand-by supply.
   III. Emergency lights shall be provided in the staircases / corridors.

7. Flat entrance and kitchen doors (if provided) shall be of solid core having fire resistance of not less than one hour (solid wood of 45 mm thickness).

8. The fire resistance rating for staircase F.R.D., Lift lobby / protected lobby & the lift doors as per N.B.C provisions.

9. Electric cable shafts shall be exclusively used for electric cables and should not open in staircase enclosure.

10. Inspection doors for shafts shall have two hours fire resistance.

11. Electric shafts shall be sealed at each floor level with non combustible materials such as vermiculite concrete. No storage of any kind shall be done in electric shaft.

12. Electric wiring/cable shall be non-toxic, non flammable, low smoke hazard having copper core/fire resistance for the entire building with provision of ELCB/MCB.

13. Low & medium voltage wiring running in shaft and in false ceiling should run in separate conduits.

14. Water mains, telephone lines, intercom lines, gas pipes or any other service line should not be laid in the duct for electrical cable; use of bus bar / solid rising mains instead of cables is preferred.

15. Preferably bus bar system shall be installed from ground to all upper floor main supply.
16. Separate circuits for firefighting pumps, lifts, staircases and corridor lighting and blowers for pressurizing system shall be provide directly from the main switch gear panel and these circuits shall be laid in separate conduit pipes, so that fuse in one panel and these circuits shall be laid in separate conduit pipes, so that fuse in one circuit will not affect the others. Such circuits shall be protected at origin by an automatic circuit breaker with its no-volt coil removed.

17. Automatic smoke detector system shall be provided in each electric shaft on each floor along with response indicator which shall be connected to main consol panel board on ground floor level and each floor level.

18. Master switches controlling essential service circuits shall be clearly labeled.

19. LIFTS:-
   A. PASSENGER LIFT:
      (i) Walls enclosing lifts shaft shall have a fire resistance of not less than two hour
      (ii) Shafts shall have permanent vent of not less than 0.2 sq mtrs in clear area immediately under the machine room
      (iii) Landing doors and lift car doors of the lifts shall be of steel shuttered with fire resistance of one hour.
      (iv) Fire lift shown in the plan shall be as per specifications laid down under the regulations, a toggle switch shall be provided to this lift for the use of Fireman.
      (v) Threshold of non combustible material shall be provided at the entrance of each landing door.
   B. FIRE LIFT:
      (i) Walls enclosing lift shafts shall have two hours fire resistance
      (ii) The shafts shall have permanent vent equal 0.2 sq mtr clear area under the Lift Machine Room
      (iii) Landing doors and lift car doors shall be of steel shuttered type with one hour fire resistance.
      (iv) To enable fire services personnel to reach the upper floor with the minimum delay, one fire lift shall be provided and shall be available for the exclusive use of the firemen in an emergency and the directly accessible to every dwelling of each floor
      (v) The lift shall have a floor area of not less than 1.4 sq mtrs with a minimum dimension of 1.12 mtrs. It shall have loading capacity of not less than 545 kg (8 persons lift) with automatic closing doors
      (vi) There shall be an alternate electric supply of an adequate capacity apart from the normal electric supply the building and the cables run in a route safe from fire, i.e. within the lift shaft. In case of failure normal electric supply, it shall automatically trip over to alternate supply
      (vii) The operation of fire lifts should be by a simple toggle or two button switch situated in glass-fronted box adjacent to the lift at the entrance level. When the switch is on, landing call points will become inoperative and the lift will be on car control only or on
priority control device. When the switch is off, the lift will return to normal working. This lift can be used by the occupants in normal times.

(viii) The words “fire lift” shall be conspicuously displayed in fluorescent paint on the lift landing door at each floor level & threshold of non combustible material shall be provided at the entrance of each landing door.

20. CAR PARKING:
   (i) Drainage of the car parking area of all the levels shall be laid independent from that of the buildings & it shall be provided with catch pit & fire trapped before connecting the building drainage or Municipal drainage
   (ii) Drainage of the car parking areas at all the levels shall be so laid as to prevent any overflow in the staircase, lift shaft etc
   (iii) The Automatic Sprinkler System provided to the entire car parking area

21. WATER TANK REQUIREMENTS

a. Under Ground Water Storage Tank:
   An underground water storage tank of 1,00,000 litres capacity shall be provided as per the design specified in the rules with baffle wall and fire brigade collecting breaching. The layout of which shall be got approved from H.E./s department prior to erection. The tank shall be connected to sprinkler system.
   The tank shall be provided in such a manner that its manholes are accessible to fire appliances and depth of the tank from manhole level shall not be more than 7 mtrs. The tank shall be flushed with the courtyards and the roof slab of the tank shall be reinforced suitably to bear the load of fire engines weighing up to 48 m tones each with a point load of 10 kgs/sq cms

b. Overhead Water Storage Tank:
   A tank of 30,000 ltrs capacity shall be provided on staircase shaft at the terrace level, the layout of which shall be got approved from H.E’s departments prior to erection. The tank shall be connected to wet risers through a booster pump through a non-return valve gate valve.

c. Wet-riser cum down comer:
   Wet riser of internal dia of 15 cms of G.I ‘C’ Class pipe shall be provided in the duct adjoining the staircase with double hydrant outlet & hose reel at each floor in such a way as not to reduce the width of the common corridor. Pressure reducing discs or orifices shall be provided at lower level so as not to exceed the pressure of 5.5 kgs per sq cms. A fire service inlet on the external face of the building near the tank directly fronting the courtyards shall be provide to connect the mobile pump of the fire service to the wet riser cum down comer

d. Fire Service Inlet:
(i) A fire service inlet on the external face of the building near the tank directly fronting the courtyards shall be provide to connect the mobile pump of the fire service to (a) The wet riser & (b) Sprinkler system.

(ii) Breeching connection inlet shall be provided to refill U.G tank

(iii) Operating switches of fire pumps shall be also provide din glass fronted boxes at ground floor

e. Automatic Sprinkler System
Automatic sprinkler system shall be provided in each habitable room of each flat, in lift lobby, common corridor at each floor level, as per the standards laid down by T.A.C. or relevant I.S specifications.

f. Automatic Smoke Detection System
Automatic smoke detection system shall be provided in electric meter room, lift machine room & in electric shaft at every floor level with response indicator, same should be connected to main consol panel on ground floor level, as per its specification

g. Fire pump, Booster pump. Sprinkler pump & Jockey pump:
   (i) Wet-riser shall be connected to a fire pump at ground level of capacity of not less than 2400 ltrs/min cable of giving a pressure of not less than 3.2 kgs /sq cms at the top most hydrant
   (ii) Booster pump of 900 ltrs /min capacity giving a pressure of not less than 3.2 kgs/sq cms at the top most hydrant outlet of the wet riser shall be provided at the terrace level.
   (iii) Sprinkler pump of suitable capacity along with jockey pump shall be provided for automatic sprinkler system
   (iv) Electric supply (normal) to these pumps shall be independent circuit
   (v) Operating switches for booster pumps shall be also provided in glass fronted boxes in lift lobbies on each floor at prominent place.
   (vi) Operating switches of fire pumps shall be also provided in glass fronted boxes at ground floor
   (vii) All above pumps should be surface mounted or vertical turbine type (submersible pump not permitted) pump along with adequate size of pump room

h. External Hydrants:
Courtyard hydrants shall be provided at distance of 30.00 mtrs each within the confines of the site of the wet riser-cum-down comor. Hose box with tow non percolating ISI marked hoses (length not less than 15 mtrs) & branch shall be equally distributed on ground floor as well as on each floor near the hydrant outlet

i. Alternate source of power supply:
An alternate source of L.V/H.V supply from a separate sub-station or D.G set with appropriate change over switch shall be provided for fire pump, fire lift, staircase, corridor lighting circuits, sprinkler pump, jockey pump and fire alarm system, detector systems, etc It shall be housed in a separate cabin.

j. Portable fire extinguishers:
a) Dry chemical powder type fire extinguisher of 06 kgs capacity having I.S. certification mark and two bucket filled with dry clean sand shall be kept in electric meter room as well as in lift machine room
b) Dry chemical powder type fire extinguishers of 06 kgs capacity having I.S.I certification mark and four bucket filled with dry clean sand shall be kept for every 100 sq mtr area of parking stilt on ground.
c) ABC Type Fire Extinguishers of 6 kgs capacity having I.S.I certification mark should be provided on each floor of building.

22. PUBLIC ADDRESS SYSTEM:
The building shall be provided with public address system as per the rules with main control operator at console panel at ground floor area

23. FIRE ALARM SYSTEM:
The building shall be provided with manual fire alarm system with main control panel at ground floor level and pill-boxes and hooters at each upper floor level. The layout of fire alarm system shall be in accordance with I.S specification.

24. SIGNAGES:
Self-glowing/fluorescent exit signs in green color shall be provided showing the means of escape for the entire building

25. PANEL BOARD OF FIRE FIGHTING SYSTEM:
Fire alarm system, public address system, alternate supply, etc panels shall be installed on ground floor at the location shown in the plans & which shall be manned 24 hours.

26. REFUGE AREA:
Cantilever refuge area adm 35.6o sq mtrs provided at mid landing of each staircase of the building in between 7th-8th, 9th-10th, 11th-12th, 13th-14th, 15th-16th, 17th-18th floors shall be conforming to the following requirements:

Manner of refuge area

a) The refuge area shall be provided with railing / parapet of 1.20 mtrs
b) R.C.C covering shall be provided above the topmost cantilever refuge area
c) The refuge area shall have a door which shall be painted or fixed with a sign in luminous paint mentioning “REFUGE AREA”
d) The lift/s shall not be permitted to open into the refuge areas.
e) Facilities to be provided at refuge area
   a. Adequate emergency lighting facility shall be provided
f) Terrace floor as a refuge floor:
   a. The necessary facilities such as emergency lighting, drinking water, etc shall be provided.
b. The access door/s from the enclosed staircase/s to the terrace floor shall have louvers at top half portion of the door. The entrance doors to the terrace shall be painted or fixed with sign painted in luminous paint mentioning “REFUGE AREA”.

g) The fire fighting installation shall be carried out by licensed approved agency.

h) The schematic drawings/plans of Sprinkler system, smoke detection system, wet riser system, public address system etc shall be got approved from CFO prior to installation.

9. MAKE OF EQUIPMENTS AND APPROVED MANUFACTURERS

1. M.S. Pipe 200 mm and above  
   a. Zenith  
   b. Jindal

2. G.I. Pipes upto 150 mm  
   a. Zenith  
   b. Jindal

3. Sprinkler Heads  
   a. SHJD  
   b. Sharp (Monsher)

4. a) Ball Valve  
   a. Honeywell or approved equivalent

   b) G.M. Gate Valves  
   a. Honeywell or approved equivalent

5. a) Electric Motor  
   a. ABB HX Series  
   b. Siemens  
   c. Kirloskar

   b) Pumps  
   a. Mather and Platt India Ltd.  
   b. Kirloskar

6. Installation Control Valves and Alarm Valves  
   a. Sanje  
   b. Grinnel UL/FM listed

7. Landing valve  
   a. Monsher  
   b. Shah Bhogilal

8. Fire Hose  
   a. Flex Drops (Yong Won ENC LTD.)  
   b. Jayashree (Permaline)

9. Butterfly valves  
   a. Honeywell or approved equivalent

10. Hose Reel  
    a. Monsher  
    b. Suken

11. Hose Pipe  
    a. Sharp (Monsher)
<table>
<thead>
<tr>
<th></th>
<th>Item Description</th>
<th>Supplier 1</th>
<th>Supplier 2</th>
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<tr>
<td>12</td>
<td>GM Instantaneous Coupling</td>
<td>a. Monsher</td>
<td>b. Newage</td>
</tr>
<tr>
<td>13</td>
<td>Air Release Valve</td>
<td>a. Honeywell or approved equivalent</td>
<td></td>
</tr>
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<td>14</td>
<td>Gun Metal Branch Pipe with Instantaneous type nozzle</td>
<td>a. Monsher</td>
<td>b. Newage</td>
</tr>
<tr>
<td>15</td>
<td>Pressure Gauge</td>
<td>a. FIEBIG</td>
<td>b. Guru</td>
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<tr>
<td>16</td>
<td>Alarm Flow Switch</td>
<td>a. Senje</td>
<td>b. Procicorn</td>
</tr>
<tr>
<td>17</td>
<td>Anchor fasteners</td>
<td>a. Power or approved equivalent</td>
<td></td>
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<tr>
<td>18</td>
<td>Paints</td>
<td>a. Asian paints</td>
<td>b. Shalimar</td>
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<tr>
<td>19</td>
<td>G.I. Pipe fittings</td>
<td>a. Zoloto –M or approved equivalent</td>
<td></td>
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<tr>
<td>20</td>
<td>Portable Fire Extinguishers</td>
<td>a. Senje</td>
<td>b. Minimax</td>
</tr>
<tr>
<td>21</td>
<td>C.I. Recoil type Non Return Valves</td>
<td>a. Honeywell or approved equivalent</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>CI Sluice Valves</td>
<td>a. Honeywell or approved equivalent</td>
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</table>
SPECIFICATIONS FOR ELECTRICAL WORK

1. GENERAL REQUIREMENTS – ELECTRICAL WORKS:-

The contractor should inspect the site and acquaint himself fully with the extent, nature and character of work involved and should carefully examine the specifications, conditions of contract and drawings and offer an installation complete in all respects, tested as directed and commissioned to meet with the intent and purpose of these specifications.

The contractor shall provide without any extra charge all items, apparatus, appliances, material and labour whether specifically mentioned or not but which are usual or required to make a complete installation and to ensure safe and satisfactory operation.

2. STANDARDS:-

All materials and components shall be new and of approved makes. A list of acceptable makes of major items is given in schedule of approved material.

The entire installation shall be carried out in conformity with the relevant Indian Standard Specifications, the Indian Electricity Acts/Rules, Electrical Inspector, regulations and codes of the Fire Insurance Association of India-Bombay Region and any or all other applicable Indian standards or statutory regulations or codes.

Reference to all codes or standards is to their latest issues and in the absence of any code or standard, the relevant British standard codes of practice shall apply.

3. DEFINITIONS:-


4. LIST OF RELEVANT I.S. CODES:-
<table>
<thead>
<tr>
<th>IS</th>
<th>Description</th>
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<tbody>
<tr>
<td>IS : 159</td>
<td>Bus bars and Bus bars connection.</td>
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<tr>
<td>IS : 8623</td>
<td>Factory built accessories of switchgear and control gear for voltage up to</td>
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<tr>
<td></td>
<td>and including 1000 V. A.C. and 1200 volts D.C.</td>
</tr>
<tr>
<td>IS : 1259</td>
<td>Mild steel tubes</td>
</tr>
<tr>
<td>IS : 2667</td>
<td>Specification for fittings for rigid steel conduits for electrical wiring.</td>
</tr>
<tr>
<td>IS : 1653</td>
<td>Rigid steel conduits for electrical wiring (revised) with amendments.</td>
</tr>
<tr>
<td>IS : 5133</td>
<td>Boxes for enclosures of electrical accessories.</td>
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<tr>
<td>IS : 2551</td>
<td>Danger Notice Boards.</td>
</tr>
<tr>
<td>IS : 1818</td>
<td>Alternating current isolators (disconnectors ) &amp; earthing switch.</td>
</tr>
<tr>
<td>IS : 2584</td>
<td>Test for Electrical Strength.</td>
</tr>
<tr>
<td>IS : 732</td>
<td>Electrical wiring installation (System voltage nor exceeding 650 volts) code of practice.</td>
</tr>
<tr>
<td>IS : 4615</td>
<td>Switch socket –outlet (non-interlocking type)</td>
</tr>
<tr>
<td>IS : 3854</td>
<td>Switches for domestic and similar purposes.</td>
</tr>
<tr>
<td>IS : 1293</td>
<td>Three pin plugs and socket outlets.</td>
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<tr>
<td>IS : 10810</td>
<td>Cables methods of tests.</td>
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<tr>
<td>IS : 1554</td>
<td>Specification for PVC insulated electric cables for working voltages upto</td>
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<td>and including 1100 Volts.</td>
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<td>IS : 2147</td>
<td>Degree of protection provided by enclosures for low voltage switch gear and</td>
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<td></td>
<td>control gear.</td>
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<tr>
<td>IS : 4237</td>
<td>General requirements for switchgear and control gear for voltage not</td>
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<tr>
<td></td>
<td>exceeding 1000 volts.</td>
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</tbody>
</table>

In addition to the above the Electric Installation shall meet all applicable Indian electricity Rules, Fire insurances regulations and Lift rules and all other statutory regulations.


5. CABLE WORK:-

5.1 Cable conductor shall be either of copper or aluminium stranded solid and specified as per drawings. Size and types specified on the drawing. Specification shall not be substituted by any other size/type without prior approval of Architect-PMC/BPCL.

5.2 660 Volts single core unarmoured wire with PVC insulation shall confirm to IS: 694

5.3 All contacts shall be silver tipped and be capable of interrupting minimum 10 Amp. at 250 Volts without damaging the contacts.
6. CABLE ACCESSORIES:-

6.1 Single compression cable gland, Heavy duty type Nickel plated (coating thickness not less than 8 to 10 microns) made from Brass/Aluminium/M.S. consisting of gland body with hexagonal head compressor nut, flat check nut, rubbering innutriile, metal washer.

6.2 Termination of all cables shall be done through cable boxes, brass cable gland of proper size and a brass earthing tag.

6.3 Termination of all single core and multicore cables shall be done through tinned copper lungs of proper size and same shall be Crimped with the help of hydraulic crimping machine.

6.4 Telephone cables T.V. Co-axial cables and power cables shall not be allowed to run side by side, but shall be separated to avoid interference due to induction.

Brass bolts, nuts & washers shall be used for termination of cables/strips on earth plates, busbars, breaker terminals.

27. EARTHING:-

7.1 All the metal clad equipment like brackets, panels, capacitor banks, switch fuse units DB’s, pumps motors & switch sockets shall be earthed by an earth conductor of suitable size at two diagonally opposite points.

7.2 The distance between any two Earth stations shall be at least 3 Mtr.

7.3 All the light fittings, switch sockets, fans, Heaters/Geysers etc. shall be earthed by earth conductors of the adequate size and through proper tinned copper lugs.

28. SCOPE OF CONTRACT:-

The scope of this contract includes the liaison work with Electrical inspector and dept. of state electricity board for obtaining load sanction provisions and final approvals and certification. The mandatory fee required to be paid to the Electrical inspector and state electricity board for testing & commissioning shall be deposited by the BPCL. All other expenses incurred by the contractor during testing, commissioning and energising the system shall be borne by the contractor.
TECHNICAL SPECIFICATIONS

L.T. SWITCH BOARD PANEL, SUB MAIN & METERING PANEL

1. SCOPE OF SUPPLY

The scope of supply comprising of designing engineering, obtaining approval of Architect-PMC/BPCL, fabricating as per approved drawing, testing at work, packing, forwarding, supplying storing at site, checking at site, Touching up all damaged portion.

The panel shall be designed for operation in highest of ambient temperature and high humidity tropical atmosphere conditions.

2. STANDARD

The equipment shall be designed to conform to the following requirements and to the latest amendment, in the codes or relevant IS applicable standard and CPRI approved.

- **IS : 8623**: Factory Build assemblies of switch gear and control gear
- **IS : 4237**: General requirements for switch gear and control gear for voltage not exceeding 1100 Volts
- **IS : 2147**: Degrees of protection of enclosures for switch gear and control gear.
- **IS : 375**: Arrangement of bus bars

LT panels shall be fabricated for 415 Volts, 3 phase, 50 HZ, 4 wire systems capable of fault withstand capacity of 50 kA for a duration of one second, metal enclosed, indoor cubicle type having incoming, sectionalisation and outgoing switch gears as specified with a degree of enclosure protection of IP 52 in accordance with IS 2147.

3. CONSTRUCTION

Factory assembled switch boards shall be floor mounted, free standing, totally enclosed and extensible type, dust and vermin proof with lockable arrangements, suitable for the prevailing climatic conditions and with all provisions for the safety of operation and maintenance personnel.

Cubicle type switch boards shall be fabricated from 2mm CRCA sheet steel. Wherever necessary, sheet steel members shall be stiffened by angle iron framework. Circuits shall be installed on the principle of compartmentalisation and segregation. Unless otherwise approved, incomer and bus section panels or sections shall be separated and Independent and shall not be
mixed with sections required for feeders. Each section of rear accessible type boards shall have hinged access doors. Overall heights of boards shall not exceed 2.45 meters with operating levers, handles and the like of the highest unit not being installed at a height exceeding 1.8 meters and those of the lowest unit not being lower than 300 mm from finished floor levels. Multi-tier mounting of feeders is permissible and the general arrangement for multi-tier construction shall be such that the horizontal tiers present a pleasing and aesthetic finish. General arrangements shall be approved by the Architect-PMC/BPCL before fabrication is commenced. Cable entries for feeders shall be made from either the rear or the front through cable alleys located in between two circuit sections minimum 300mm wide. Cable entries shall be through gland plates, there being separate gland plates for each cable entry such that there will be no dislocation of already wired circuits when new feeders are added. Cable entry plates shall be sectionalised and the construction shall include all necessary cable supports for clamping cables in cable alleys or in rear cable chambers.

The minimum size of the compartment for ACB, MCCB’s, and SFU’s shall be as following:

i. MCCB 100 to 400 Amp. - 450 x 450mm
ii. MCCB 400 to 630 Amp. - 600 x 600mm
iii. ACB 630 to 300 Amp. - 900 x 900mm
iv. ACB 1000 to 1600 Amp. - 900 x 1000mm
v. ACB 2000 to 3200 Amp. - 1000 x 1500mm

Voltmeters and ammeters shall be flush mounted type size of 144 mm² for incoming feeders and 96 mm² for outgoing feeders conforming to Class 1.0/1.5 of IS 1248 for accuracy. Voltmeters shall be protected with HRC cartridge fuses.

On MV panel incomers ON/OFF phase indicator lamps shall be provided suitable for operation on AC 230 Volts supply, lamps being protected by proper HRC fuses. Necessary filters G/Y/R/A shall be provided depending upon the function. Where phase indicator lamps are provided they shall be associated with necessary ON/OFF toggle switches and all lamps shall have in-built resistors.

Small wiring controls, indicators and the like shall be wired with approved PVC insulated, stranded copper conductor cables conforming to IS 1554 Part I. Wiring shall be protected within switchboards and runs of wires shall be neatly bunched and adequately supported and clamped. Tags and/or labels shall be provided for easy identification of wiring. Identification ferrules shall be used at both ends of wires. Control wiring meant for external connections is to be brought out on terminal boards. Wiring shall be minimum 1.5 sq. mm. and for CT circuits shall be 2.5 sq. mm. copper Lugs insulation tape, etc. shall be provided at all joints and terminations.

**4. BUS BARS AND BUS BAR CHAMBERS**

Bus bars shall be of E91 Grade high conductivity aluminium alloy or high strength 99.95% purity
tinned copper of adequate section. Bus bar systems may comprise of totally enclosed main horizontal bus bars run at the top and vertical bus bars serving all modules in vertical sections on either side in cable entries. Connections to individual circuits from bus bars shall be with solid connections. Horizontal and vertical bus bars and connections shall be sleeved with PVC or insulated in any other approved manner. Temperatures of bus bars shall not exceed 85 degrees C, viz. not exceeding a 35 degree rise over the ambient temperature. Calculations for temperature rise and bus bar sizing shall be furnished to the Engineer for approval.

Bus bars shall be firmly fixed on supports constructed from SMC (glass fiber reinforced thermosetting plastic). Supports shall be sufficiently robust to withstand effectively electro-mechanical stresses produced in the event of short circuits.

Connections to bus bars rating more than 200 amps shall be made with bolted clamping arrangements. For smaller ratings the use of holes drilled into bus bars may be made. Nuts and bolts used for connections to bus bars shall be of Stainless Steel bolt and nuts with suitable precautions taken against heating due to bi-metallic contact.

For tapping off connections from bus bars, VIR/PVC insulated wire shall be used for current capacities up to 63 amps and solid PVC insulated conductors/strips for higher current capacities.

Minimum clearances to be maintained for open and closed indoor air insulated bus bars/electrically non-exposed and working at system voltages up to 600 volts shall be 22mm for Phase to Earth and 30mm for Phase to Phase & phase to neutral.

5. RATING AND REQUIREMENTS

5.1 Moulded Case Circuit Breakers
Moulded case circuit breakers shall have the indicated voltage and current ratings, rated duty, rated short circuit breaking capacity and be provided with a facility for padlocking in the "OFF" position and a rotary operating handle with adjustable shaft extension. Unless otherwise indicated, they shall be of the independent manual closing air-break type, rated for uninterrupted duty and provided with auxiliary contact (1 NO. and 1 NC) and under voltage releases.

5.2 Current Transformers
All phases shall be provided with current transformers of Class - 1 accuracy and suitable VA burden and ratio to operate associated metering.

5.3 Distribution
Meters and indicating instruments shall be flush mounted and draw out type. Indicating lamps shall be low burden, filament type within built resistors.

The control circuit shall be protected with suitable rating of HRC Fuse of 50 kA or higher.
5.4 Earthing
Components, frames and the link shall be properly earthed. 25mm x 5mm galvanised iron earth bars shall be provided for LT panels over the full length and connected to the framework. Provision shall be made for connections from earth bars to main earthing bars on both sides of LT panels.

5.5 Painting
Sheet steel shall be degreased, pickled in acid, cold rinsed, phosphated, passivated and finally sprayed with a high corrosive resistant primer and baked in an oven. The finish shall be two coats of epoxy paint of approved colour and stoved.

5.6 Labels
Anodised aluminium, PVC coated labels shall be provided on all incoming and outgoing feeder switches. Circuit diagrams showing the arrangement of circuits inside LT panels shall be pasted to the inside of panel doors and covered with transparent laminated plastic sheet.

5.7 Meters
Meters shall be housed in separate compartments and be accessible from the front only.

6. PER PHASE ISOLATION DISTRIBUTION BOARDS
WITH AUTOMATIC SOURCE CHANGEOVER WITH CURRENT LIMITER (ACCL) FOR DG SUPPLY

Miniature circuit breaker distribution boards:

6.1 General:
Miniature circuit breaker distribution boards shall conform to IS ; 2675, IS: 8623 and shall be suitable for operation on three phase, 4 wire, 415 V, 50Hz, AC supply or single phase, 2 wire, 230 V, 50 Hz, AC supply.

The distribution boards shall have incoming TPN MCB with SPN MCB Type 10kA Automatic Source changeover with current limiter, 3 Nos. DP RCCB and on outgoing side single phase MCB.

The rating of the incomer 3 Nos. DP RCCB and rating and number of ways of DB shall be as indicated in relevant drawings and bill of quantities and short circuit capacity of minimum 10KA.

6.2 Cabinet Construction:
The distribution board cabinet shall be I.P. 42 protection totally enclosed type with dust and vermin proof construction. The cabinet shall be made out of 2mm thick CRCA sheet
steel with fine welding, grounding and phosphatized and shall have stove enameled gray shade finish. The interior shall be finished to off-white shade.

The distribution boards shall have gasketted conduit / cable entry plates at the bottom and top.

6.3 Internal connections:
100 A, rating copper bus bars shall be provided. The internal connections in the DB shall be by PVC insulated, stranded copper conductor wires with lugs crimped at both ends.

6.4. Terminals:
Distribution box shall be provided with terminal block of adequate size to receive incoming and outgoing circuits. The location of the terminal block shall be so located that crowding of wires in the proximity of live parts is avoided. A neutral link having rating equal to that of phase bus bar shall be provided.

6.5 Directory:
Distribution boards shall be provided with a directory indicating the area or loads serviced by each circuit, breaker, the rating of breakers, size of conductors etc. The directory shall be mounted in metal holder with a clear plastic sheet on inside surface of front door.

6.6 Installation:
Distribution boards shall be surface mounted or recessed mounted as specified and erected at the locations shown on the drawings and at 2.5 Mt. above finish floor level unless specified otherwise

6.7 Insulation resistance shall be tested with 1000 V meggar and the values should as should be as shown below;

- Between phase - 2.5 mega ohms
- Between phase & neutral - 1.5 mega ohms

6.8 The conduit entry plates shall be removed and drilled for suitable size holes to suit the conduit sizes. All the cables/conduits shall be properly terminated using glands, grips, check nuts etc.

Wiring shall be terminated properly using crimping lugs / sockets and PVC identification ferrules. No bare conductor shall be allowed inside the board. Distribution boards shall be bonded to the earth at least at two points using brass bolts and lugs. Suitable name plate and danger plate indicating the voltage shall be fixed to the front cover.
6.9 **Testing:**

The distribution boards shall be tested as per IS: 2675. The tests shall include insulation test, high voltage tests etc. Testing at site of distribution boards, shall be carried out after completing the erection work, for insulation resistance.

6.10 **All the MCB's shall be "C" Curve Characteristic.**

6.11 **Laminated A3 or A4 size SLD & control drawings copy shall be pasted inside the DB door.**

7. **MOULDED CASE CIRCUIT BREAKER**

The MCCB's shall be if double break, quick break trip free operation shall comply the following feature:

Interrupting capacitor for different rating in KA at 415 V, 50Hz, 0.2 P.F.

(a) Up to 100 Amp - 35 KA
(b) Above 100 Amp & up to 800 A - 50 KA

Non –welding silver alloy main contacts and arcing contract with arc chutes.

Inverse time instantaneous o/c, temperature, compensated advisable and integral tripping mechanism.

Moulded, heat resistance resin handed fiberglass or phenotic material housing.

Under voltage & current operated earth fault releases for incoming MCCB’s and earth fault released for incoming MCCB’s and earth fault releases to operate on 1 to 2A for MCCB's used at power outlets shall be provided.

8. **SWITCHES AND SWITCH FUSE UNITS**

The switches & switch fuse unit shall be of AC 23 duty and shall comply the following features.

i) Quick make, quick break, double break, silver alloy contacts with arcing horns & chutes.
ii) Common Operating handle.
iii) Switch fuse units of combination fuse switch type with fuses on phase circuit and copper solid links for neutral circuit for TPN unit.
iv) Fuses shall be a 30 KA Short Circuit Rating.
9. CABLING

9.1 The scope under this section covers the following:

- Power cables
- Control cables

9.2 STANDARDS:

The following standards shall be applicable.

- **C)** IS : 5831: Specification for PVC insulated and sheath of electric cables.
- **D)** IS : 6474: Polythene insulation and sheath of electric cables.
- **E)** IS : 3975: Specification for mild steel wires, strips and tapes for armouring of cables.
- **F)** IS : 694: PVC Insulated cables.
- **G)** IS : 1554: PVC insulated (heavy duty) Electric cables.
- **H)** IS : 4288: PVC insulated & PVC sheathed solid aluminium conducted cables of voltage rating not exceeding 1100 V.
- **I)** IS : 7098: Specification for cross linked polythene insulated PVC sheathed cables.
- **J)** IS : 5959: Polythene insulated and PVC sheathed (heavy duty) electric cables.
- **K)** IS : 3961: Recommended current ratings of cables.

9.3 GENERAL REQUIREMENTS

9.3.1 Power cables shall comply of the following:

- MV cables – 1100 V grade with standard copper conductors upto and including 16 mm sq. and standard aluminium conductors for 25mm sq.
  - Colour coded insulation.
  - PVC inner and outer sheathing applied for extrusion
  - Steel armouring between inner and outer sheathing

9.3.2 Control cables shall be 600 V grade multi-core copper conductor with PVC insulation,
with stand short circuit currents and bring the voltage drop within the specified limits.

9.4 CONDUCTORS
The copper conductors shall comply with the requirements specified in IS :2982 and aluminium conductor IS : 1753.

9.5 INSULATION

9.5.1 The type of insulation shall be as indicated in the drawing and bill of materials. The thickness of insulation shall be on the basis of insulation material, voltage and the conductor size conforming to the relevant standard specification. The cores shall be colour coded to Indian Standard Specifications.

9.5.2 The PVC cables shall be with polythene of natural unfilled compound.

9.5.3 The PVC insulation and sheathing shall be of high quality and conforming to the following.

9.6 SHEATHING

The sheathing shall be PVC and shall be before and after the armouring, the thickness of the sheathing shall be based on the conductor size and overall diameter below the sheathing.

9.7 ARMOURING

Single core cables shall be without armouring. But is insisted it shall be of magnetic material. Multi core cables shall be with armouring. The armouring for cables upto 16 mm sq. shall be galvanized steel strips.

9.8 INSTALLATION

9.8.1 Power cable laying shall strictly be as follows:

In full length without joints or splices.

- Mark the routing on drawings and at site and get it the routes are not available on drawings.

- Spacing of cable support for self supported cables on wall, ceiling or trenches shall be as follows:
## Horizontal run

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Vertical run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upto 10 mm</td>
<td>350mm 450mm</td>
</tr>
<tr>
<td>16 to 95 mm</td>
<td>450mm 500mm</td>
</tr>
<tr>
<td>120 to 400 mm</td>
<td>700mm 900mm</td>
</tr>
</tbody>
</table>

- Plastic identification makes at every 15m for cables laid indoors, at bends and both ends.
- Cables laid underground shall be at a depth not less than 600mm with sand bedding and protective bricks or tiles extending at 10m spacing in addition to markers above ground at bends, loops and crossing.
- Provide hume pipes, trenches or tunnels at built-up areas and roads crossings.
- Provide loops of minimum 500mm radius at each ends.
- Cable should be bend to a radius of not less than 20 times the diameter of the cables with aluminium of 8 diameters at space restriction.

### 9.8.2 Control cables shall be laid away from the power cables

### 9.8.3 The power cable termination shall have necessary brass glands and shall be as follows:

- Pressure clamp insertion type up to 5 sq.mm. Tinned copper termination shall be through pressure clamp insertion type lugs.

### 9.8.4 Cable fixing on wall/ceiling shall be with G.I. Spacers and heavy duty G.I. Saddles and necessary metal screw.

### 9.9 TESTING

a) LT Cables shall be tested after installation using 1000 V & 500 V insulation resistance tester respectively and the following readings recorded:

- Continuity on all conductors
- Insulation resistance
  i) Between conductors
  ii) All conductors & ground.
10. WIRING INSTALLATION

10.1 The scope under this section covers wiring installation consisting of:

A) Lighting circuit
B) Power circuit
C) Equipments

10.2 STANDARDS

A) IS:732 COP for electrical wiring installation (system voltage not exceeding 650V)
B) IS1646 COP for fire safety for building (General) electrical installation.
C) IS:5216 Guide for safety procedures & practice in electric work.
D) IS 4648 Guide for electrical layouts on residential buildings.
E) IS : 302 General & safety requirements for lights electrical appliances.
F) IS: 9537 Specification of conduits for electrical installation.
G) IS :1653 Rigid steel conduits for electrical wiring.
H) IS 2509 Rigid non-metallic conduits for electrical installation.
I) IS : 3480 Flexible steel conduits for electrical wiring.
J) IS : 3667 Fittings for rigid steel conduits for electrical wiring
K) IS : 3837 Accessories for rigid steel conduits for electrical (wiring).
L) IS : 6946 Flexible (pliable) non-metallic conduits for electrical installation.
M) IS : 3419 Fittings for rigid steel conduits for electrical wiring.
N) IS : 694 PVC insulated wires.
O) IS : 8130 Conductors for insulated Electric cables & flexible cords.
P) IS : 5133 Boxes for enclosures of electrical accessories.
Q) IS : 2148 Flame proof enclosure for electrical apparatus.
R) IS : 4949 2A switches for domestic & similar purposes.
S) IS : 1087 5A tumbler switches.
T) IS : 2120 15A tumbler switches
U) IS : 1293 3 Pin Plugs and sockets
V) IS : 4705 Switch socket outlet (non-interlocking type)
W) IS : 370 Reversible type 2 pin plugs & sockets without earthing connection.
X) IS : 5561 Electrical power connectors
Y) IS : 2004 PVC insulated wires.

10.3 DRAWING

10.3.1 Prior to laying of conduits the contractor shall submit the shop drawing for layout of conduits.
for approval. The drawing shall indicate the route and the no. and sizes on the conduits, location of junction/inspection/pull/outlet boxes, size and location of switch boxes number and size of wires pulled through each conduit and all other necessary relevant details.

10.3.2 Only after the drawings are approved, the contractor shall proceed with the work of laying of conduits. The Architect-PMC/BPCL reserves the right modify or alter or reject the shop drawing and contractor in responsible to re-submit the revised/modified drawing for approval.

10.3.3 **Site Layout**

Before the conduits are installed the exact route shall be marked at the site for approval and actual work shall be undertaken only after approval.

10.3.4 **Load Balancing**

Balancing of circuits in three phase installation shall be planned before the commencement of wiring & shall be strictly adhered to.

10.4 **Definition of Point Wiring**:

*Internal & Common area lighting Point wiring shall comprise of following:*-

- MCB controlled Primary point (from MCB to first light point).
- MCB controlled Secondary point with 1.5 sqmm looping (from point to point of same circuit)
- MCB controlled Primary point (from DB to control switch board).
- Primary point without switch (from switch board to switch board looping)
- Secondary point with switch (from switch board to first light point).
- Secondary point without switch (from light point to light point).
10.5 Scope of Work:-

The medium voltage distribution system wiring shall be carried out in the under mentioned manner:

10.5.1 Providing, installation, concealed rigid PVC heavy duty Conduits confirming IS:2509 with necessary accessories, switch boxes and outlet box.

10.5.2 Providing and drawing of wires of required size including earth continuity wire.

10.5.3 Providing and installation and connecting of control switches & socket shall be rated capacity and shall comply the following features:
- Silver contracts with shrouded current carrying terminals.
- Brass or copper female outlets enclosure
- Moulded urea formaldehyde casing and cover plates.
- The outlet boxes shall be factory fabricated out of machine pressed sheet steel passivated as per the switch manufacturer.
10.5.4 The point shall be complete with the branch wiring from the switch board to the outlet point in heavy duty PVC conduit with accessories, confirming to IS:2509 control, switch, socket outlet boxes ceiling roses, angle holder, connector etc. minimum size of conduit used shall be 20mm dia.

10.5.5 All wiring shall be with concealed conduit wiring system with rigid PVC heavy duty conduit & shall include all wiring from MCB distribution boards to point control switch boxes & from these switch boxes to light, 5A socket, exhaust fan, call bells etc and from MCB distribution boards to power point socket for power wiring.

10.6. Cables / Wires

All Cables / wires used for internal wiring shall be FRLS (Fire retardant low smoke) PVC insulated single core single / stranded copper conductor as specified and or 650/1100 volts grade, wires shall conform to I.S. specification.

All wires shall be colour codes as follows:
Single phase - Red
Three Phase - Red, Yellow, Blue
Neutral - Black
Earth - Green or green/ yellow (insulated)
Control (if any) - Gray

The wires shall be supplied in sealed coils of 100 meters length and bear the manufacturers name, trademark, ISI mark, voltage grade etc.

Wires originating from two different phases shall not be run in the same conduit.
The size of wires for permit and the number of insulated wires/cables that may be drawn into the conduit shall be as per the following

Light Circuit points : 1.5 sq.mm copper
Light Secondary points : 1.5 sq mm copper
5 Amp socket outlet points : 1.5 sq. mm. Copper
Power Points : 4 sq. mm copper
Equipments : According to the load current

Maximum permissible number of 650 volt grade single core wires that may be drawn into rigid PVC conduit.
<table>
<thead>
<tr>
<th>Cable Size In Sq.mm.</th>
<th>Size of Conduits (mm) (maximum No. of Cables)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
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<tr>
<td>1.5</td>
<td>6</td>
</tr>
<tr>
<td>2.5</td>
<td>5</td>
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<td>4</td>
<td>3</td>
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<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>--</td>
</tr>
<tr>
<td>16</td>
<td>--</td>
</tr>
</tbody>
</table>

Conductors having nominal cross section area exceeding 4 sq.mm. shall always be provided with crimping type cable sockets.

The sub circuits wiring for points shall be carried out in looping system and no joints shall be allowed in the length of the conductor.

Circuit wiring shall be provided with printed PVC identifications ferrules at either end bearing the circuit number & designation.

General wiring installation, shall be as under

10.7 Sub-Main wiring / Circuit Wrng:-

Wiring from switch board to the MCB distribution board.

The Sub-main wiring shall be three phase four wires system. Each sub-main wiring circuit shall have its own earth continuity wire. no. & size of earth wire shall be as per BOQ.

Not more than 8 light points shall be grouped on the one lighting circuit. The load per circuit shall not exceed 800 watts. The minimum size of conductor for lighting circuit shall not be less than 1.5 sq.mm. Power circuit wiring shall not have more than two sockets connected to one circuit.

10.8 T.V. Antenna System

The scope of TV Antenna system under this section cover providing concealed PVC rigid conduit heavy duty ISI Mark 20/25mm dia. from tap off box (as located in the layout Drawing)
for each outlet socket including provisioning T.V. socket Co. axial cable RG – 11 from tap off box to the outlet socket. Providing of incoming cable to tap off box is beyond this scope.

10.9 Telephone System:

The scope of telephone system under this section cover providing of concealed PVC rigid conduit heavy duty ISI mark 20/25 mm dia including five pair (ten core) telephone cable from each telephone outlet socket upto tag block as located in layout and telephone cable from L.V. box tag block to floor tag block provided in the electrical duct the socket outlet shall be jack type and necessary conduit accessories junction boxes and draw boxes etc.

10.10 Earthing

- Insulated earth conductors of specified size shall be taken through the conduits.
- The size of earth wire shall be of size 50% of phase conductor.
- All the outlet boxes, switch sockets and light fixtures to be earth properly.

11. L.T. PANEL:

The scope of L.T. Panel shall be as of cubical indoor, floor mounting type, sheet steel, clad dust, and vermin proof, I.P. - 53 protection L.T. Panel Boards, suitable for 440 Volts, 3 Phase, 4 Wire, 50 Hz, supply System. Complete with cable allays, bus bars, solid inter connection between bus bars to switch gears, TOP/BOTTOM cable entries as required, powder coated finish of approved shade etc. all as specified.

- The ACB Breaker (LSIG) shall be microprocessor based & MCCB’s (LSIG) below 400 amp shall be thermal magnetic & above shall be microprocessor based protection.
- All MCCB’s shall with additional Earth fault relay (LSIG).
- LT panels shall be ‘FORM-4,TYPE-3b’, suitable for indoor installation, use on 415 Volts 3-phase, 4 Wire, 50Hz.
- Density of aluminium busbars shall be 0.78 A/sq mm & Copper shall be 1.2 A/ Sqmm.
- All the switchgear shall have short circuit rating as per BOQ.
- The Earthing for all components, frame etc. to a common internal earthing bar.
- MS base frame for Standalone panels.
- All the switchgear breaking capacities shall be ICU = ICS.

(Note: Contractor has to submit panel drawing for approval before starting the fabricated work).
12. LIGHTING PROTECTION SYSTEM:

12.1 Lightening arrestor shall be with 20mm dia. 1 meter long copper rod having 200 x 200 x 6mm brass plate as a base plate and arrestor with copper rod of 75mm dia. 5 Nos. 6mm dia., 100mm long spokes duly fixed on surface with anchor fasteners.

12.2 25 X 6 mm GI earth strip shall be looped on parapet wall at terrace level and down conductor at 4 corner clamping to external wall of the building upto the test link block.

12.3 32 X 6 mm GI earth strip shall be from the test link box to earthing pits partly open & partly underground.

12.4 Earth terminal test joint boxes shall be fabricated and out 14 gauge CRCA sheet galvanized with 250mm long 40 x 6mm G.I. Earth terminal plate with long brass nut bolts duly fixed in a box.

12.5 Pipe Type earth pit with 75mm dia. G.I perforated pipe 3 mtr. length as earth conductor, watering G.I. Perforated pipe funnel masonry chamber, complete as per IS 3043 latest Rate to include all excavation and back filling upto depth of 3.0 meter and bringing the surface to the original finish

13. APPROVAL OF LAYOUT AT SITE:

Contractor shall prepare drawing for layout of conduits in slabs of each floor of each flat. These drawing shall be submitted to the Architect-PMC/BPCL for approval at least 10 days before the likely date of casting the particular slab. The approval shall be accorded by Electrical Consultant before casting the roof slab. Contractor shall ensure that the conduits are laid in the slab as per layout approved.

Contractor shall mark the location of all switch boards, points and layout of conduits on walls at site and take approval of Architect-PMC/BPCL before commencement of cutting of chase and laying conduits/M.S. boxes. This shall be recorded.

14. MATERIALS:

All materials for fittings, accessories etc. to be incorporated to this work shall be ISI marked and if Indian Standard have not been issued then it shall be as per approval of Architect-PMC/BPCL.
15. GENERAL:

a) All outlets in stilt area stairs and other common areas will be connected to the distribution boards provided as shown on drawing through separate conduits.

b) Power plug at following location shall be wired one per circuit at all other location. It shall be two per circuit irrespective of what is shown on drawing.
   
   i. Master Bedroom
   ii. Toilet Geyser

c) Ceiling fan points will be complete with supply fixing of fan hook with box and covered with 3mm thick hylem sheet at bottom duly screwed in the slab as per approved sample.

d) Call bell point for each dwelling unit shall be include providing and fixing of approved bell of Anchor make big size in each flat.

e) Meter boxes shall be painted and numbered as required and as directed.

f) Switch board boxes shall be recommended make.

16. ELECTRICAL TEST:

Entire Electrical installation shall be tested by the contractor in the presence of and to the satisfaction of the Architect-PMC/BPCL and Electricity Department for insulation and earth continuity, record of these tests duly signed and dated by the contractor has to submit to Architect-PMC/BPCL.

17. AVIATION LIGHT :-

i) Flashing Type "B" Twin aviation obstruction light (AOL L-864) shall be with following details:-

   ➢ Input Voltage :- AC - 230 Vac +/- 3% , DC - 12 Vdc , 24 Vdc, 48 Vdc
   ➢ Luminous Intensity 360° Radial :- >1500 Candela
   ➢ Colour of Light :- Red, Wavelength 626 nm
   ➢ LED Viewing angle :- 30°
   ➢ No. Of Flashes :- 20 to 60 Flashes Per Minute (ADJ.)
- Visibility LEDs: 4.9 Kilometers, 5mm Round, Water Clear Lens
- No. Of LEDs: 720 Nos.
- Wattage: 52 Watts Peak
- Power Factor: 0.95
- Life Expectancy of LEDs: App. 1,00,000 Hours
- HV Testing: 1K5 Voltage for 1 Min.
- Ambient Light Sensor: Light Dependant Resistor
- Operation Controller: Built in AC operation only
- Lamp Base Material: Aluminum LM6
- Lamp Base External Finish: Aviation Yellow
- Upper Enclosure Dome: Transparent Polycarbonate
- Cable Entry: 20mm Threaded with V2" BSP
- Hardware Dimensions: Stainless Steel SS304, W: 169mm and H: 235 mm
- Weight: 1.5 Kgs.
- Conforms: ICAO - Chapter 6 & Table 63 FAA - AC150 5345-43e
- Ingress Protection: IP65 - IEC 60947

ii) Wiring for 250 volts single phase and neutral 6 amps switched socket outlet near aviation obstruction light.

iii) Supply & Installation of 24 x 7 Timer for control of aviation obstruction light.

iv) Mounting Mast (Pole): Supply & install steel fabricated FRP mast shall be clamp on to steel mast from the side, with 'U' bolt & the terminal can be fitted on to the FRP mast directly with
suitable base plate, termination arrangement for the Down-Conductor.

v) Providing and fixing Junction Box all complete for termination of 3C x 2.5 sqmm copper cable for aviation obstruction light.

18. FIRE ALARM SYSTEM:

The system shall consist of following:-

a) Fire alarm system shall be provided with Microprocessor based intelligent 1 Loop Analog Addressable Fire Alarm Control Panel with a capacity of minimum 99 detectors and 99 devices per loop at ground floor level.

b) There will be Smoke Detectors, Heat Detectors, Manual call point & hooter cum strobe on Ground floor Car parking & Entrance lobby area.

c) There will be Smoke Detectors, Manual call point & hooter cum strobe on every lift lobby area on all upper floors.

d) Smoke detector shall be Analog addressable Optical with standard mounting base, LED, Address Switch, complete with MS Powder coated Junction Box for mounting on Surface / on False Ceiling / Below False Floor, Cable lugs at Ends, cable compression glands, cable tags and Ferruling.

e) Heat Detector (Rate of Rise Cum Fixed temperature) shall be Analog addressable with standard mounting base, LED, Address Switch, complete with MS Powder coated Junction Box for mounting on Surface / on False Ceiling / Below False Floor, Cable lugs at Ends, cable compression glands, cable tags and Ferruling.

f) Manual Call Point shall be addressable with Address Switch and all mounting accessories, complete with MS Powder coated Junction Box for mounting on Surface, Cable lugs at Ends, cable compression glands, cable tags and Ferruling.

g) Hooter cum Strobe shall be loop Powered complete with MS Powder coated Junction Box for mounting on Surface, Cable lugs at Ends, cable compression glands, cable tags and Ferruling.

h) Wiring for the above system shall be ISI Marked 2 Core (Twisted Pair) x 1.5 mm2, Multistranded Copper, FRLS, Armoured cable, RED in Colour, laid on surface with GI saddle-spacers every 0.3 meters. Complete with GI Junction Box, lugs, cable compression glands, cable tags and Ferruling.

19. EXTERNAL EARTHING:

The scope of work shall be earthing stations laying of Copper Earthing strips and connecting to power panels, D.B.’s, switch board & equipment etc.

The following standard and rules shall be applicable

ii) Indian Electricity & Rules.

All codes and standards mean the latest where not specified otherwise, the installation shall generally follow the IS code of practice.

20. EARTHING STATION:

i. **Plate Earthing Station:**

GI Plate Earthing Station shall comprise of earth station conforming to IS -3043 with 600 x 600 x 6mm G.I. Plate and necessary length of 40 x 6mm G.I. Earthing Strip including provision for GI Pipe funnel plug top masonry in CI Frame and cover plate and 15cm alternative layer of charcoal and salt as specified.

Copper Plate Earthing Station shall comprise of earth station conforming to IS -3043 with 600 x 600 x 3mm Copper Plate and necessary length of 40 x 3mm Copper Strip including provision for GI Pipe funnel plug top masonry in CI Frame and cover plate and 15cm alternative layer of charcoal and salt as specified.

The plate electrode shall be buried below permanent moisture level but in any case not less than 2.5 Meter below ground level. The earth resistance shall be maintained with suitable soil treatment and watering arrangement. The earth plate shall be set vertically and surrounded with 150mm thick alternate layer of charcoal dust and salts mixture. The earth conductor and funnel over the watering pipe shall be housed in a masonry chamber 300 x 300 x 500mm (deep)

The masonry chamber shall be provided C.I. Cover resting on C.I. frame.

ii. **Pipe Earthing Station:**

Pipe earthing station shall comprise earth pit with 75mm dia. G.I perforated pipe 3 mtr length as earth conductor, watering G.I. Perforated pipe funnel masonry chamber, complete as per IS 3043 latest. All excavation and back filling shall be up to depth of 3.0 meter and bringing the surface to the original finish.

21. OUTDOOR LT FEEDER PILLAR:

i) All distribution feeder pillars shall be outdoor type suitable for 433 volt, 3phase, 50 cycles, AC system and shall conform to IS 5039. Feeder pillar details shall be as per BOQ.

ii) The Feeder pillar shall be fabricated out of MS angle iron 50mm x 50mm x 5mm frame and 10 SWG sheet steel with slanting roof top and adequately ventilated by providing louvers with stainless steel wire mesh from inside. The feeder pillar shall be provided with degree of
iii) The bottom skirts of the pillar shall be fabricated out of 10 SWG G.I. sheet steel with the louvers on the front and back with stainless steel wire mesh from inside as per the drawing. After carrying out anti corrosive treatment, the feeder pillar shall be painted by oven backed painting with green colour and bottom skirt shall be painted with black color.

iv) The front and back doors shall be provided with triple heavy duty brass hinges with stainless steel pin and sleeves and MS handle for opening the door. Each door should open by minimum 135 degrees. Latch type shall have padlocking arrangements with Godrej type lock and duplicates keys.

v) Asbestos Cement sheet lining shall be provided on inner side of the door. Inside the pillar two compartments shall be formed using 6mm thick asbestos sheet separators. Rear part will be used for cable entry and cable connections. Front portion will be used for cable entry and cable connections. Front portion will be used for fuse replacement.

vi) Electrolytic copper busbars of size 60mm x 5mm, 1 no. per phase and duly painted with epoxy paint red, yellow, blue for R,Y,B phases shall be used. For neutral one electrolytic copper busbars of size 50mm x 5mm shall be used with black epoxy paint. The busbars shall be mounted on suitable busbar supported / fixed to the main body/frame.

vii) Fuse bases shall be mounted on MS channel hot dip galvanized of size 65mm x 25mm x 3.15mm, fixed horizontally and which in turn will be supported on hot dip galvanized angle iron 40mm x 20mm x 3.15mm fixed vertically. The feeder pillars shall be provided with HRC fuses of rating as specified.

viii) Split phase busbar shall be connected through solid links removable type on incoming side of the porcelain fuse bases, electronic copper strips 2 nos. of 50mm x 3mm size shall be used as jumpers between outgoing of fuse base and cable terminal for each outgoing circuit. These jumpers shall be supported on 12 mm thick backlight strips. The jumper ends on the cable terminal side shall have 2 nos. of holes suitable for connecting cable by means of 2 nos. of nut bolts for each crimping type copper lugs.

ix) GI gland plate 3 mm thick and detachable type shall be provided with required Nos. of knockout of suitable size for the cable entry. Siemens type brass cable gland proper ventilation. One illuminating lamp shall be provided inside the pillar and the lamp shall be switched ON when the panel door is opened. The pillar shall display danger on front and back doors on the front door.

x) Two nos. of earthing terminals with GI threaded stud of 12mm size welded to the body, on opposite side shall be provided on inner side of the pillar for connecting earthing strips from earthing stations.

xi) All nut bolts, washers and fasteners used for electrical connection shall be stainless steel and all other nuts shall be GI.

xii) For fixing the foundation bolts (of size 12mm x 250mm long) the pillar bottom frame shall be provided with 4 Nos. of 18mm dia. Holes. The foundation bolts shall be provided with spring and plain washers and lockouts and the bolts shall be grouted in the foundation concrete block of grade 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40mm nominal size) 600mm above ground level.
22. MAKES OF MATERIALS:

The scope of this section covers the recommended makes of equipments, material component. The final choice of makes shall be indicated at the time of finalization of the item during execution of works.

The make of material recommended are as shown below. The offers shall be strictly on the basis of the make recommended.

<table>
<thead>
<tr>
<th>Item</th>
<th>Make</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCCB</td>
<td>SCHNEIDER NXS / L&amp;T DSINE / LEGRAND DPX</td>
</tr>
<tr>
<td>L.T. 1.1 KV CABLES</td>
<td>POLYCB / RR CABLE / FINOLEX</td>
</tr>
<tr>
<td>CONDUITS</td>
<td>PRECISION / DIAMOND</td>
</tr>
<tr>
<td>MCB (10 KA) &amp; MCB DB</td>
<td>SCHNEIDER C60 / HAGGER / LEGRAND / SIEMENS</td>
</tr>
<tr>
<td>AUTOMATIC SOURCE CHANGEOVER WITH CURRENT LIMITER</td>
<td>HAGGER</td>
</tr>
<tr>
<td>KRONE TYPE TELEPHONE BOXES</td>
<td>ITL / DLINK</td>
</tr>
<tr>
<td>TELEPHONE CABLES</td>
<td>POLYCB / ITL</td>
</tr>
<tr>
<td>FRLS COPPER WIRES (SINGLE PVC)</td>
<td>POLYCB / RR CABLE</td>
</tr>
<tr>
<td>MODULAR SWITCHES</td>
<td>SCHNEIDER ( ZENCELLO INDIA) / LEGRAND ( MYRIUS) OR AS PER APPROVED EQUIVALENT</td>
</tr>
<tr>
<td>LT PANELS, METERING PANEL &amp; FIRE SYSTEM PANEL</td>
<td>PRBHAT POWERTECH / VIVID ELECTROMECH / AS PER APPROVED EQUIVALENT</td>
</tr>
<tr>
<td>AUTO TRANSFER SWITCH (ATS)</td>
<td>ASCO 230 SERIES</td>
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<tr>
<td>FIRE ALARM SYSTEM equipments</td>
<td>MORLEY / FIRELITE / ESSER</td>
</tr>
<tr>
<td>FIRE SYSTEM CABLE</td>
<td>POLYCB / RR CABLE</td>
</tr>
<tr>
<td>LED LIGHTING FIXTURES (INTERNAL &amp; EXTERNAL)</td>
<td>CROMPTION / WIPRO / PHILLIPS / BAJAJ</td>
</tr>
<tr>
<td>CHIME TYPE CALL BELL</td>
<td>ANCHOR OR REPUTED MAKE</td>
</tr>
<tr>
<td>EXHAUST FANS</td>
<td>CROMPTON / KHAITAN / POLAR /BAJAJ</td>
</tr>
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<td>CEILING FANS</td>
<td>CROMPTON / BAJAJ / USHA/ HAVELLS</td>
</tr>
<tr>
<td>INSTANT &amp; STORAGE TYPE WATER GEYSER</td>
<td>RACOLD / CROMPTON / BAJAJ / SPHEREHOT</td>
</tr>
<tr>
<td>STREET LIGHT POLES</td>
<td>LOCALLY FABRICATED AS PER IS STANDARDS</td>
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<tr>
<td>OUTDOOR FEEDER PILLAR</td>
<td>POPULAR SWITCHGEAR PRIVATE LTD. / PRBHAT POWERTECH / VIVID ELECTROMECH / AS PER APPROVED EQUIVALENT</td>
</tr>
<tr>
<td>LIFTS</td>
<td>KONE / OTIS</td>
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<tr>
<td>DG SET</td>
<td>KIRLOSKAR / CUMMINS</td>
</tr>
<tr>
<td>SOLAR PV SYSTEM</td>
<td>MNRE APPROVED</td>
</tr>
</tbody>
</table>

23. REGULATIONS & STANDARDS:-

All work and materials shall strictly conform to the latest Rules and Codes, requirements of Local Authorities, Local Licenses etc. with particular reference to the following publications (modified, amended and/or corrected up to date) applicable to electrical installation.

a) The Indian Electricity Act, 1910
b) The Indian Electricity Rules, 1956
d) Regulations for the Electrical Equipment of Buildings, Insurance Association of India, Bombay Regional Council (Fire Section)
f) Indian Standard specifications applicable to the separate and individual materials, components and appliances of the installation. Where Indian Standard Specifications have not yet been drafted for any materials or components, then the Contractor shall refer to the Consultants for guidance.

It is the Contractor’s responsibility to acquaint himself with all correct and up to date standards. Specifications and Codes as Practice applicable to the workmanship, materials and equipments used in the electrical installation.

Whenever the Tender Specification calls for a higher standard of material and/or workmanship
than that required by any of the above regulations, then the Tender Specification takes precedence over the said regulation and standards.

**SPECIFICATION OF LIFTS (PASSENGER & STRETCHER LIFT)**

The proposed building will have 2 nos. passenger lifts & 1 No. stretcher lift with following specifications -

a. Gearless Lifts with Microprocessor based VVVF / VF Regenerative drive with Machine Room on top.

b. Capacity-
   i. Passenger Lift- 10 passenger/ 680 Kg (minimum)
   ii. Stretcher Lift- 15 passenger/ 1020 Kg (minimum)

c. Speed (mps)- Not less than 1.75MPS mps

d. Power Supply- 400/415 Volts (3 Phase AC)

e. Stops- 20 Stops With (all opening on the same side)

f. Car Operation- Triplex full collective operation in normal mode, however necessary arrangement for operating Stretcher lift in Simplex mode & passengers in duplex mode whenever required.

g. Car and all door finish- Scratch proof (honeycomb) Stainless steel finish

h. Ventilation- Cross flow fan with auto cut off

i. Hand Rails- Stainless Steel Mirror Finish Handrails on rear car panels

j. Flooring- Granite

k. Fire Rated Doors- As per CFO approval.

l. Pit Depth- As per drawing

m. Overhead- As per drawing

n. Shaft dimensions (W x D – mm)-
   i. Passenger Lift -2000 mm W x 2500 mm D
   ii. Stretcher Lift- 2000 mm W x 3000 mm D

o. Safety Features-
i. Anti-nuisance Car Call Protection,
ii. Overload Device,
iii. Emergency Firemen’s Service,
iv. Battery operated Emergency Car Light Unit,
v. Infrared Curtain Door Protection
vi. Battery operated Emergency Alarm Button
vii. Automatic rescue device.
viii. Automated Doors
ix. Provision of emergency key at all landing doors

p. Landing/ Car Operating Panel-
i. Hairline/Mirror finish stainless steel faceplate, flush mounted
ii. Dot Matrix/16 segment position indicator with directional arrow
iii. Stainless steel round surface mounted buttons with ring illumination
iv. Emergency stop button in car

q. Intercom-
Press & Speak type intercom facility shall be provided by the contractor in the Car Operating Panel with dialing Key Pad. The intercom shall be hooked up to the existing Colony telephone system. If this intercom facility is not connectable to BPCL System, then the contractor has to make necessary cutouts in the car and place suitable telephone instrument compatible with BPCL telephone exchange.

r. Announcement System –
A suitable landing announcement system with built in speakers to indicate arrival of a particular floor shall be provided inside the car. Also for emergency recorded announcement.

s. The Contractor shall liaison with all the statutory authorities and shall obtain the MCGM / PWD / Lift inspector license or Any other statutory approvals required for Installation & subsequent commissioning / running of the Lifts. Contractor shall also obtain License for running of the lifts after full completion & submit it to BPCL.

t. The Contractor is required to provide preventive and breakdown maintenance at no extra cost during the Defect Liability Period (DLP) of one year after the lift equipment is commissioned and occupation certificate of the building is obtained and handed over to BPCL.
SPECIFICATION OF DG SET

The proposed building will have 1 no. DG set fully under acoustic & weather proof enclosure with AMF panel having following specifications -

a. Capacity- 320 KVA
b. Energy efficient and CPCB compliant
c. Microprocessor based controller
d. Noise level less than 75 dBA.
e. AMF panel
f. Monitoring & Diagnostic Features for-
   Phase Voltage& Current, frequency, reverse power, KVA, KWH, PF, canopy temp., Lube oil pressure, Engine temp., RPM, Run Hours, No. of starts, fuel level, Auto/Manual Start/ Stop button, Battery charger condition etc. One year DLP

The DG set should be as per CPCB norms.

The Contractor has to obtain necessary NOC approval from CPCB/ Electrical inspector or any other authority.

The Contractor is required to provide preventive and breakdown maintenance at no extra cost during the Defect Liability Period (DLP) of one year.

SPECIFICATION OF SOLAR PV SYSTEM

The proposed building will have approx. 20 kWPp Grid Connected Solar PV system without battery backup. This is required to be installed on shadow free roof top of proposed building. The Components like solar PV modules, Inverters etc should be MNRE approved and the entire installation should be as per MNRE standard. The electrical output is required to be connected to the main electrical feeder of building with net metering system. The module mounting structure should be made up of MS steel angle/ Channel/ Rolled Perlin with hot dipped galvanized for long life. All nuts & bolts should be made of SS 304 grade.

System should have 5 year warranty of entire system through manufacturer. During warranty period the manufacturer will be required to repair or replace faulty parts with new one without any extra cost to BPCL. Also the manufacturer should depute representative to visit site once in quarter to check healthiness and trouble free operation of system.

The manufacturer should be MNRE approved.
SPECIAL CONDITIONS OF CONTRACT
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1.0 **GENERAL**

1.1 Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, specifications of work, drawings, scope of work and any other document forming part of this contract wherever the context so requires.

1.2 Notwithstanding the sub-division of the document into these separate sections and volumes, supplementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.

1.3 Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, then unless different intention appears, the provision(s) of the Special Conditions of Contract shall be deemed to override the provision(s) of General Conditions of Contract only to the extent that such repugnance or variance cannot be reconciled with the conditions of contract and shall be to the extent of such repugnance of variations, prevail; it being understood that the provisions of General Conditions of Contract shall otherwise prevail.

1.4 Wherever it is stated anywhere in this document that such and such a supply is to be effected or such and such a work is to be carried out, it shall be understood that the same shall be effected/carried out by the Contractor at his own cost, unless a different intention is specifically and expressly stated herein or otherwise explicit from the context.

1.5 The materials, design and workmanship shall satisfy the latest, relevant Indian Standards, the job specifications contained herein and latest codes as applicable to. Where the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied. In the absence of any standard/specifications/codes of practice for detailed specifications covering any part of the work covered in this tender, the instructions/directions of Architect-PMC/BPCL will be binding on the Contractor.

1.6 The items given under Schedule of Items shall be read in conjunction with materials and job specifications and in case of any irreconcilable conflict between them, the provision in the item under Schedule of Rates, will override the corresponding provision only if the material and job specifications, which cannot be reconciled. In such cases, the decision of Architect-PMC/BPCL shall be final and binding on the Contractor.

1.7 In case of contradiction between Indian Standard, General Conditions of Contract, Special Conditions of Contract, specifications, Drawings, Schedule of Rates, the following shall prevail in order of precedence.
   i) Fax of Intent, detailed Letter of Intent alongwith statement of Agreed Variations and its enclosures.
   ii) Schedule of Items and Technical details.
iii) Special Conditions of Contract.
iv) Job Specification and drawings
v) General Conditions of Contract.
vi) Indian Standards/Technical Specifications.

1.8 Wherever it is mentioned in the specification that the Contractor shall perform certain work or provide certain facilities, it is understood that the contractor shall do so at his cost.

1.9 Prior to quote for the job, the bidder will be required to visit the site and clarify all the doubts (if any) from Engineer in charge. Otherwise it will be presumed that the bidder has understood the work in all respect.

1.10 All items required for completion as mentioned in scope of work are included in contractor’s scope

1.11 Site Location:– Near Block No. 5, BPCL Staff Colony, Azizbaug, Chembur

1.12 BPCL being an Owner has a complete overall right / veto power to take a decision on any issue (as the case may be) in the interest of the project and can override the decisions of Architect-PMC and the decision of BPCL is final and binding.

2.0 TIME SCHEDULE

2.1 The total contractual completion period is 26 months from the date of Letter of Intent (LOI). This includes mobilisation period of 1 Month from the date of Letter of Intent. Completion of project is considered only on obtaining Occupation Certificate (OC) along with P-Form & C-Form and complete approvals and water connection at site.

Contractor shall submit detailed bar chart along with un-priced Technical bids and abide by it if awarded.

2.2 The period of contract given includes monsoon periods, the time required for mobilization as well as testing, rectifications, if any, re-testing and completion in all respects to the entire satisfaction of Architect-PMC/BPCL.

2.3 A programme of execution of work will be prepared by the, Architect-PMC and contractor as per BPCL Requirements. This programme will take into account the time of completion mentioned in 2.1 above.

2.4 Monthly/weekly time schedule will be drawn up by with the contractor based on availability of work fronts and the time schedule as per 2.1 & 2.2 above. The Contractor shall strictly adhere to these targets by deploying adequate personnel and construction tools and tackles and he shall also supply himself all materials of his scope of supply in good time to achieve the targets set out in the weekly and monthly time schedule. In all matters concerning the extent of targets
set out in the weekly & monthly time schedule / targets and the degree of achievements, the decision of the Architect-PMC/BPCL shall be final & binding on the contractor.

2.5 Contractor shall give daily reports on category wise labour and equipment deployed along with the progress of work done on previous day in the proforma prescribed by the Architect-PMC/BPCL.

2.6 Should the contractor’s preparation for the commencement of the work or any portion of it or its subsequent rate of progress from any cause other than force majeure conditions as stated in General Conditions of contract whatsoever go slow in opinion of the Architect-PMC/BPCL, the contractor will not be able to complete the work or any portion thereof within the stipulated time for completion, the provision of sub article 2.10 below shall apply.

2.7 In case of delay in completion beyond stipulated time, not withstanding the grant of formal extension of time for completion of work by the BPCL, all extra costs, on account of change in statutory regulation/acts or increase in prices on any other account during the extended time shall be borne by contractor.

i) If required, work shall be performed for extended hours to meet the targeted schedule at no extra cost. All expenses shall be borne by the contractors and at no point of time extra payment shall be considered for what so ever the reason may be.

2.8 The time for completion and phased time schedule shall be subject to and shall be in accordance with the provision of sub article below.

2.9 Neither BPCL nor contractor shall be considered in fault in performance of their obligations if such performance is prevented or delayed by force majeure conditions as stated in General Conditions of contract.

2.10 In case the progress of work is unduly and unreasonably delayed by the contractor without sufficient cause, BPCL at the contractor’s risk and cost and without prejudice to any of the rights under the contract reserve the right to :

(a) Terminate the contract wholly or partially and reassign it to others after giving 30 days notice in writing to the contractor to remedy the causes complained of.

(b) Make any modifications, deletions, additions to the contract as BPCL may consider necessary to ensure its satisfactory execution after giving 7 days notice to contractor to remedy the cause complained of.

3.0 PROJECT EXECUTION

3.1 Contractors shall observe in addition to Codes specified in respective specification and requisition, all national and local laws, ordinances, rules and regulations and requirements pertaining to the work and shall be responsible for extra costs arising from violations of the same.
3.2 Contractor shall have at all times during the performance of the work, a competent Site Engineers on the premises. Any instruction given to such Site Engineers shall be construed as having been given to the contractor.

3.3 Architect-PMC/BPCL reserves the right to inspect all phases of contractor’s operations to ensure conformity to the Specifications and Requisition in the contract.

3.4 BPCL may appoint Engineers, Architects, Project management Consultants (PMC), inspectors or other duly authorised representatives, made known to the contractor & these representatives shall be present during progress of the work and such representatives shall have free access to the work at all items. The presence or absence of an Architect-PMC/BPCL’s representative does not relieve the contractor of the responsibility for quality control in all phases of the work. In the event that any of the work being done by the contractor or any Sub-contractor is found by Architect-PMC/BPCL’s representatives to be unsatisfactory or not in accordance with the Procedures, Specifications of Technical Documents of this tender, the contractor shall, upon verbal/written notice of such discrepancy or deficiency, take immediate steps to revise the work in a manner to conform to the relevant Procedures and Specifications.

3.5 The contractor shall carry out required supervision and inspection as per Architect-PMC/BPCL approved Quality Assurance Plan and furnish all assistance required by Architect-PMC/BPCL in carrying out inspection work during this phase. If Architect-PMC/BPCL’s representative notifies any deficiency, or recommends action regarding compliance with the Specifications and Exhibits of Technical Documents of this tender, the contractor shall comply with such instructions to complete the work conforming to the Specifications, Requisition.

3.6 The contractor shall maximise the employment of local labour, skilled and/ or unskilled, to the extent available.

3.7 In case any part or parts of the work is/are sub-contracted, the contractor shall ascertain availability of and endeavour to employ the local sub contractors.

3.8 The contractor shall, however, be responsible for maintaining quality of work and adherence to Time Schedule as per the requirements specified in the Agreement.”

3.9 The Contractor’s responsibility covers the co-ordination of all the works involved and expenses, site mobilisation including clearing activities. The quoted rate is deemed to have been appropriately covered and no separate claim whatsoever is entertainable.

3.10 All existing structures, overhead lines, existing pipelines, utilities & cabling (both underground & aboveground) shall be checked by the contractor before taking up the execution of work. BPCL shall also provide information, to the extent possible. Contractor shall execute the work in such a manner that the said structures, utilities, pipelines cabling etc. are not disturbed / damaged.
3.11 The contractor shall Redo / Repair at his own cost, all the existing facilities viz. Roads, Paving, Drainage etc which are damaged (if any) during Transportation, Construction and Erection activities performed by him.

3.12 Contractor if required, has to work in two or three shifts( round the clock) per day (per shift of 8 hours) as instructed by Architect-PMC/BPCL after taking all necessary permissions from BPCL.

4.0 JOB EXECUTION

4.1 Contractor shall submit a detailed Job execution plan for completing the works as per requirements which shall cover:-
- Contractors Project Organisation and Site Organisation
- Manpower Mobilisation Schedule (Category wise & Number to be deployed monthwise).
- Machinery Deployment Schedule
- Temporary Facilities plan
- Detailed Project Schedule & Weekly Micro Schedules
- Field Quality Control Procedure
- Site Laboratory Set up
- Safety & Security Regulations
- Work Planning, Progress Reporting, etc

4.2 The project work shall be strictly carried out as per contract specifications and latest applicable codes and practices whichever is stringent.

4.3 Architect-PMC/BPCL reserves the right to send samples of all construction material supplied by contractor, to Architect-PMC/BPCL approved Laboratories for testing at Contractor’s cost.

4.4 Upon completion of all works, contractor shall demobilise fully from the Colony premises including demolishing of all contractors establishments and restoration of ground conditions to satisfaction of BPCL.

4.5 All excess and surplus including salvageable waste shall be allowed to be taken back after reconciliation and certification by BPCL Engineer-In-charge with respect to brought in quantities, consumed material and excess left over.

4.6 TECHNICAL PERSON AT SITE/DEPLOYMENT OF ENGINEERS

a) Contractor shall depute sufficient manpower during contract and ensure effective output with quality to meet the agreed schedule /bar chart. Contractor shall depute Engineers, Supervisors etc. As per clause ‘D-Inspection of works under Brief Scope of work’ or More as per the work requirements and as per the instructions of Architect-PMC/BPCL.
b) Contractor shall depute full time safety supervisor/safety Officer who shall be responsible for safe work practices at site.

5.0 PROJECT SCHEDULING & MONITORING

The following schedules/documents/reports shall be prepared and submitted by the bidder/contractor for review / approval at various stages of the contract:

5.1 ALONGWITH BID

A. TIME SCHEDULE

The bidder is required to submit a Project Time Schedule in Bar Chart Form in the Technical Bid. The BPCL interface activities shall be clearly identified with their latest required dates. BPCL reserves the right to disqualify the bidder if the above schedule submitted by the bidder is not in line with the overall Project requirement.

B. SCHEDULING & MONITORING SYSTEM

The bidders should describe their system of Project Scheduling and Monitoring, the extent of computerisation, level of detailing, tracking methodology etc. with the name of computer packages and sample outputs.

5.2 AFTER THE AWARD OF CONTRACT

A. OVERALL PROJECT SCHEDULE

During the Kick-off Meeting, the contractor shall submit, a sufficiently detailed overall project schedule in the activities network form clearly indicating the major milestones, inter-relationship / interdependence between various activities together with analysis of Critical Path and Floats.

The network will be reviewed and approved by Architect-PMC/BPCL and the comments if any shall be incorporated in the network before issuing the same for implementation. The Network thus finalised shall form part of the contract document and the same shall not be revised without the prior permission from Architect-PMC/BPCL during the entire period of contract.

Based on above network, Monthly / Weekly execution Programme will be drawn up by contractor, Architect-PMC/BPCL jointly based on availability of work fronts. The contractor shall scrupulously adhere to the Targets / Programmes by deploying adequately Qualified and Competent Engineers / Personnel, Construction equipment, Tools and Tackles and also by timely supply of required materials coming within his scope of supply as per contract. In all matters concerning the extent of target set out in the Weekly / Monthly Programme and the degree of achievement, the decision of the Architect-PMC/BPCL will be final and binding on the contractor.
There may be sudden peak in the project schedule, for which the contractor shall maintain sufficient mobilization of resources to the satisfaction of Architect-PMC/BPCL to meet the daily / weekly targets during sudden peak period, without any price implication to BPCL. Depending upon requirement and progress of the work, permission for working round the clock on two-shift basis shall be granted.

B. PROGRESS MEASUREMENT METHODOLOGY

The contractor is required to submit within two weeks of the Letter of Acceptance, the methodology of progress measurement, sub-ordering, manufacturing/delivery, subcontracting, construction and commissioning work and the basis of computation of overall services/physical progress informed. Architect-PMC/BPCL reserves the right to modify the methodology in part or in full.

B. FUNCTIONAL SCHEDULES

The contractor should prepare detailed functional schedules in line with network for functional monitoring and control and submit scheduled progress curves for each function viz. ordering, delivery and construction.

5.3 PROJECT REVIEW MEETINGS :

Contractor shall present the programme and status at various review meetings as required.

A. Weekly Review Meeting :

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<th>Level of Participation</th>
<th>Contractor Site In-Charge, Planning Engineers, Job Engineers, Architect-PMC Engineers, BPCL Site Engineer</th>
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<td>Agenda</td>
<td>a) Weekly programme v/s actual achieved in the past week and programme for next week.</td>
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<td>b) Status of Material availability &amp; Delivery at site and Labour status</td>
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<td>c) Remedial Actions and hold up analysis.</td>
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<td>d) Approvals.</td>
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<td>Site Office</td>
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B. **Monthly Review Meeting :**

<table>
<thead>
<tr>
<th>Level of Participation</th>
<th>Senior Officers of BPCL, Architects-PMC and Contractor.</th>
</tr>
</thead>
</table>
| Agenda                 | a) Progress Status / Statistics  
                          | b) Completion Outlook  
                          | c) Major hold ups / slippages  
                          | d) Assistance required  
                          | e) Critical issues  
                          | f) BPCL queries / approvals required  
                          | g) any other issues related to project |
| Venue                  | BPCL Office/Site Office |

5.4 **PROGRESS REPORT :**

A. **Monthly Progress Report**

This report shall be submitted on a monthly basis within seven calendar days from cut off date as agreed upon, covering overall scenario of the work. The report shall include but not be limited, to the following:

- a) Brief introduction of the work.
- b) Scheduled v/s actual percentage progress.
- c) Areas of concern / problem hold ups, impact and action plans.
- d) Resources deployment status.
- e) Monthly Safety Report
  
  Two copies of the Report to be handed over to Architect-PMC/BPCL.

B. **Weekly Report**

This report (4 copies) will be prepared and submitted by the contractor to Architect-PMC/BPCL on weekly basis and will cover following items :

- a) Activities programmed and completed during the week.
- b) Resource deployment of manpower and machine.
- c) Qty. achieved against targeted in schedule.
- d) Record of Mandays lost.
- e) Construction percentage progress, scheduled Vs actual.

C. **Daily Progress Report**

This report (2 copies) will be prepared and submitted by the contractor on daily basis and handed over to Architect-PMC/BPCL and will cover following items :

- a) Daily Programme vs Progress (Quantity Based)
- b) Target for the next day
- c) Category wise Labour and Equipment Report
- d) Major areas of concern
6.0 WORK SCHEDULE AND CO-OPERATION

6.1 The contractor shall draw well in advance detailed schedule of work to be carried out at site and submit the same to the Architect-PMC/BPCL for approval.

6.2 The contractor shall not object to the execution of the work by other contractors or tradesmen and offer them every facility with contractors work at site. Contractor shall at all times provide sufficient fencing, notice boards, lighting and watchmen to protect and safeguard the public and the works.

6.3 Architect-PMC/BPCL shall be at liberty to object to employment of any person at work site and the objection shall be communicated in writing and contractor shall make immediate arrangements for removal of such person from site.

7.0 QUALITY ASSURANCE / QUALITY CONTROL PROGRAMME

7.1 Contractor shall include in his offer the Quality Assurance Programme containing the Overall Quality Management and Procedure, which is required to be adhered to during the execution of contract. After the award of the contract, detailed Quality Assurance Programme to be followed for the execution of contract under various divisions of works will be mutually discussed and agreed to.

7.2 Contractor shall establish document and maintain an effective quality assurance system as outlined in recognised codes.

7.3 Quality Assurance System Plans / Procedures of the contractor shall be furnished in the form of a QA manual. This document should cover details of the personnel responsible for the Quality assurance, plans or procedures to be followed for quality control.

7.4 For execution of this job, contractor shall be required to get clearances from Architect-PMC/BPCL stage wise. Also contractor shall be required to submit Quality Assurance Plan for execution of the jobs & same shall be approved by Architect-PMC/BPCL. RA Bills/Final Bill shall be released only after the due completion of all quality tests as per QAP approved by Architect-PMC.

8.0 TESTS AND INSPECTION

8.1 The Contractor shall carry out various tests as enumerated in the technical specifications/scope of work of this tender document and the technical documents that will be furnished to him during the performance of the work.

8.2 All the tests either on the field or at outside laboratories concerning the execution of the work
and supply of materials by the contractor shall be carried out by Contractor at his own cost.

8.3 All results of inspection and tests will be recorded in the inspection reports, proforma of which will be approved by the Architect-PMC/BPCL. These reports shall form part of the final documents, to be submitted to BPCL.

8.4 All coordination and liaison work in connection with the construction inspection works and approval of the relevant works by the statutory Authorities will be the responsibility of the Contractor. However, statutory fees, if any, payable to these authorities shall be paid by BPCL on production of original documentary evidence.

8.5 Statutory Fees given to statutory authorities and others for repeat tests and inspection due to failures, repairs etc. such reasons attributable to the Contractor shall be borne by the Contractor.

8.6 Inspection and acceptance of the work shall not relieve the Contractor from any of the responsibilities under this Contract.

8.7 Architect-PMC/BPCL or his authorised representative shall have access to the contractor's premises at all reasonable time to inspect, examine and test the material and workmanship at any stage during the Construction / fabrication /erection and shall have right to reject any material of workmanship which does not conform to the technical specification. They shall have right to select samples of materials delivered for the purpose of tests or to carry out any test on the completed installation. The cost of all such testing shall be borne by the Contractor. The contractor shall provide, for the purpose of inspection, access ladders, scaffolding and necessary instruments at his cost.

9.0 CONSTRUCTION MACHINERY, MATERIAL AND EQUIPMENTS

9.1 CONSTRUCTION MACHINERY

All construction machineries such as Cranes, JCB, Poclain, Dumpers, Trucks, Forklifts, Front end loaders, Bulldozers, DG sets required for the job etc. shall be arranged by contractor at his cost and shall have valid registration and tax documents as well as test certificate for load carrying capacity issued by the RTO / competent authority. All operators for operating such equipment shall have valid license. Any disputes with RTO shall be dealt with by contractor for his own construction machinery and equipment. Architect-PMC/BPCL shall not be responsible in any matters regarding statutory obligations to be fulfilled by the contractor for his own construction machinery and equipment.

9.2 TOOLS AND TACKLES :

All lifting tools like chain block, sling, material lift etc. required to be used at site, shall be tested by the statutory authority & have valid certificate for use. The copy of certificate shall be made
available for verification as and when required by Architect-PMC/BPCL.

9.3 **SCAFFOLDING:**

All scaffolding material along with fittings which is intended to be used for the job is to be of Steel scaffolding only or as directed by Architect-PMC/BPCL. It shall be in the contractor's scope of supply.

10.0 **COMMERCIAL**

10.1 Effective Date of Contract

The Effective date of Contract shall be reckoned from the date of Fax of intent / Letter of Internet/Work Order.

11.0 **CONTRACT PRICE**

11.1 The contract price shall be adjusted in case of any variation in the Built up area. Such adjustment shall be done based on the final executed quantities and the unit rates specified. The quoted unit rates shall be fixed and firm and shall not be subjected to escalation during the entire period of contract. In case of variations in the quantities, the contract price shall be adjusted considering the below ‘Clause no- 20 Pricing of additional/ cancelled/ altered / extra / new items of work’ of Special Conditions of Contract.

11.2 The unit rates quoted shall inclusive of all taxes and duties excluding VAT and Service tax. Service Tax and VAT shall be paid at actual based on govt. Notifications at the time of invoicing.

12.0 **NON DISCLOSURE**

12.1 Each party agrees not to divulge to third parties, without the written consent of the other party, any information obtained from or through the other party in connection with the performance of this Contract unless; (i) the information is known to the recipient prior to receiving same from the other party; (ii) the information is, at the time of disclosure to the recipient, then in the public domain; or (iii) the information, after disclosure to the recipient, becomes generally available to the public by publication or otherwise through no fault of the recipient; or (iv) the information is obtained by the recipient from a third party, who did not receive same, directly or indirectly from the other party and who has no obligations of secrecy thereto.

12.2 Each party further agrees that it will not, without the prior written consent of the other party, disclose to any third party any information developed or obtained by contractor in the performance of this Contract except to the extent that such information falls within one of the categories described in (I), (ii) or (iii) above.

12.3 If so requested each party agrees to require its employees to execute a non-disclosure agreement prior to performing any Work under this Contract.
13.0 LIQUIDATED DAMAGES

Clause 22 of General Conditions of Contract shall be replaced with following Text:-

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the Contractor(s) and shall be reckoned from the date on which the order to commence work is given to the Contractor(s). The work shall throughout the stipulated period of the contract be proceeded with all due diligence (Time being deemed to be of the essence of the contract on the part of the contractor(s) and if the Contractor(s) makes/make default therein, he/they shall pay as compensation the sum which may be determined.

The contractor will have to prepare and submit a detailed bar chart in consultation with the Architect after issue of work order and further to ensure good progress of work during execution, the quantity of work (in financial term linked with billing of the project) to be done within specified time would be as follow:

1. Mobilisation within 1 month (30 days)
2. 25% of the work (in financial term) within 9 months
3. 40% of the work (in financial term) within 12 months
4. 70% of the work (in financial term) within 18 months
5. Building including all infrastructural works, amenities, Occupation Certificate (OC) along with P-Form & C-Form and complete approvals and water connection at site shall be completed in 26 (Twenty Six Months) Including Monsoon periods.

In the event of the Contractor(s) failing to comply with the above progress in financial terms and any of these programs above, he/they shall be liable to pay as compensation an amount equal to 0.5 (one-Half) percent of the said contract value of the whole work for every week that the due quantity of work shall remain incomplete provided the amount to be recovered under this clause shall not exceed 5(Five) percent of the contract value as shown in the work order.

14.0 DEFECT LIABILITY PERIOD (WARRANTY PERIOD)

14.0 Refer Clause 72 of General Conditions of Contract.
14.1 Defects Liability Period shall be for 12 months from the date of issue of Completion certificate of work by Engineer-In-Charge of BPCL/ Occupation Certificate (OC) along with P-Form & C-Form and complete approvals and water connection at site whichever is later.

15.0 ESCALATION

The Bidder shall quote firm unit rates. No escalation shall be considered during entire period (including extended period) of Contract.
16.0 IDLE CHARGES

No claims for idle charge or compensation shall be entertained for idling of contractors material, labour, P&M etc. or on any account whatsoever during entire period (including extended period) of Contract.

17.0 SECURITY DEPOSIT, BANK GUARANTEE AND TERMS OF PAYMENT

17.1 SECURITY DEPOSIT

Security Deposit shall be as per Clause no. 18 of General Conditions of contract.

17.2 BANK GUARANTEE FOR WATERPROOFING

Bank Guarantee for waterproofing works shall be as per the Clause 21 of Technical Brief Of work

17.3 TERMS OF PAYMENT

1. Payment shall be made on the basis of payment schedule on monthly basis after satisfactory completion and due certification by Architect-PMC and BPCL Engineer-in-charge.

2. No advance payment shall be made to the Bidder.

3. All liasoning activities related to construction, custom clearances, insurance, transportation of material/equipments, crane arrangements, labour etc. will have to be carried out by the Bidder. The charges for these activities shall be borne by the Bidder. No extra payment will be made for these activities.

18.0 MEASUREMENT OF WORKS FOR PAYMENT:

Contract is LSTK type and payment shall be based on actual/jointly certified measurements for the work done and as per the payment schedule.

Contractor’s bill for executed works shall be accepted only when jointly certified (contractor / Architect / BPCL) and signed measurements for the said works are enclosed. After measurements, Contractor should submit bill copy to Architect-PMC/BPCL for certification thereafter final certification and billing shall be done by BPCL.

Final bill shall be submitted along with jointly certified & signed measurements within 1 month from the date of completion of total work.
19.0 MISCELLANEOUS

- Contractor shall submit to site representative of Architect-PMC/BPCL a progress report with a progress payment invoice in accordance with Scope of work and Payment Schedule /BOQ & Measurement procedure.

- The contractor shall be responsible to complete the work in accordance with Bill of Quantity and Time schedule given in the Tender Document.

- Progress payment shall be made by BPCL to Contractor every month on certification by Architect-PMC/BPCL

- Contractor shall forward two (3) copies of invoices and related documents to Architect-PMC/BPCL

- Payment will be made by NEFT (Electronic Fund Transfer). Bidder will be required to furnish details of Bank Account as required by RBI rules. Cheque payment will be done for only those cities where NEFT facility does not exist.

- Such progress payment shall be made within thirty (30) Calendar days after receipt of Contractor's invoice after deducting the following.

  2. Other recoveries as per contract.

20.0 PRICING OF ADDITIONAL/ CANCELLED/ ALTERED / EXTRA / NEW ITEMS OF WORK

Any additional/ cancelled/ altered / excess / savings /extra / new items of work shall be paid/deducted (as the case may be) as per prevailing rate of CPWD/PWD/MCGM DSR rates however if the rates are not available, rate analysis shall be adopted which shall have to be approved by Architect-PMC/BPCL prior to execution of any such work.

21.0 COMMISSION PAYMENTS

Contractor represents and agrees that no person or any entity has been retained or employed to solicit this contract upon any arrangement or understanding for the payment of any commission, fee or other compensation of any kind, except for payments to bona fide employees of contractor. Contractor further represents that neither it nor any of its affiliated companies, Subcontractors nor any of their affiliated companies nor any of their respective officers, directors, employees or agents have made, received, provided or offered, and contractor agrees that neither it nor any such other entity or person shall make, receive, provide or offer, any gift, entertainment, payment, loan or other consideration for the purpose of influencing the procurement of any particular equipment or materials or services or the
acceptance of any particular Subcontractor or otherwise to any course of conduct in any way relating to or affecting this Contract. Breach of the foregoing warranties or agreements shall constitute a material breach of this Contract which is not capable of remedy and shall give BPCL the right to terminate this Contract pursuant to the General Condition of Contract entitled Clause 24 “termination/offloading ”.

22.0 KEY PERSONNEL

Contractor shall not reassign or remove key personnel assigned for the Work without the prior written authorisation of Architect-PMC/BPCL.

23.0 SUBCONTRACTOR'S TEMPORARY FACILITIES

Contractor shall arrange all temporary facilities of his Subcontractors, Petty Contractors such as their offices or housing etc. outside the BPCL Colony limits at his own cost. Such structures shall not be constructed within the allocated areas inside the BPCL Colony boundary wall limits except if approved by Architect-PMC/BPCL Engineer-In-Charge.

24.0 REQUIREMENT OF PERSONNEL BY CONTRACTOR

The Contractor shall not recruit personnel of any category from among those who are already employed by the other agencies working at the various sites of the BPCL.

25.0 TAXES AND INSURANCE

25.1 As per Section VII of General Conditions of Contract (GCC). However, clause no. 88 of GCC stands modified in accordance with Clause 26.4 of SCC, in case variation in Taxes and Duties implemented by Central or State Government after bid due date.

25.2 C-FORM

BPCL shall not issue C- form.

25.3 DEDUCTIONS FROM CONTRACT PRICE

All costs, damages or expenses which the BPCL may have paid, for which under the Contract the Contractor is liable, shall be claimed by BPCL. All such claims shall be billed by the BPCL to the Contractor regularly as and when they fall due. Such bills shall be supported by appropriate and certified vouchers or explanations, to enable the Contractor to properly identify such claims. Such claims shall be paid by the Contractor within fifteen (15) days of the receipt of corresponding bills and if not paid by the Contractor within the said period, the BPCL may then deduct the amount, from any amount due or becoming due to the Contractor under the Contract or may be recovered by actions of law or otherwise, if the Contractor fails to satisfy the
Owner of such claims.

25.4 Subsequent Legislation(s) regarding Taxes & Duties –

The Contract Price agreed shall not be subjected to any escalation or increase for any reason whatsoever. However, if any increase/decrease is implemented by Central or State Government after bid due date and within tenure of the contract, in rate of tax(s) directly applicable on the Contract Value (for example – Service tax), Contract Price shall be adjusted accordingly. Bidders to note that variation in taxes and duties which are not directly charged on Contract Value but are applicable only on some of the activities performed under the contract (for example – excise duty, VAT, Octroi, etc paid on materials purchased by Contractor etc) shall **not** be considered for Price Variation.

26.0 LABOUR LAWS & ARBITRATION

26.1 Contractor shall take necessary labour license for their workmen; maintain necessary records as required by the local Labour officer. The contractor will comply with the provisions of the following act and indemnify the company against all claims, which may arise out of the following Acts, & Rules framed thereunder:

i) The Contract Labour (Regulation and Abolition) Act,


iv) The Payment of Wages Act,

v) The Payment of Bonus Act,

vi) The Employees Provident Fund & Misc. Provisions Act,

vii) Family Pension Scheme,

viii) Inter State Migrant Workmen (Regulation of Employment & Condition of Service) Act, or any other acts or statute not hereinabove specifically mentioned having bearing over engagement of workers directly or indirectly for execution of work.

26.2 Contractor to note that they have to produce Police clearance certificate for obtaining the gate passes for their staff, Labour and supervisory staff who shall be deputed to site for the execution of this project.

26.3 The contractor shall, at his own expenses, conform to all anti-malaria instructions given to him by the Architect-PMC/BPCL / Local authority, including the filling up of any borrow pits which may have been dug by him, dewatering, pest control treatment so as not to cause any health hazards to labours working on site.

26.4 Contractor to comply all the regulations of GRIHA regarding labour shelter, sanitation, drinking water or on any other matter. A complete write up along with photographs shall be submitted to prove that all the conditions of labour safety and work conditions on site off site have been followed.
26.5 On any matter as to the application, interpretations or effect of these rules and decision of the Chief Labour Commissioner or Deputy Chief Labour Commissioner shall be final and binding.

26.6 Apart from the above the contractor to strictly adhere to Section VIII of General Conditions of Contract.

**27.0 MODE OF CONTRACTING**

27.1 Notwithstanding anything stated elsewhere in the Bids Documents, the contract to be awarded shall be on the basis of single party responsibility.

27.2 The contract shall be in all respects construed and governed in accordance with the Indian Laws

27.3 Contractor shall not subcontract any part of the work without prior approval of BPCL.

**28.0 MOBILISATION**

a) Within 3 days of issue of contract letter the contractor shall prepare a detailed schedule of activities for completion of the work and shall get it approved from BPCL.

b) Also within 1 Month of Issue of Letter of Intent the contractor shall mobilise all necessary manpower and equipments and start the job at site as directed.

Contractor to mobilise adequate equipment and resources to complete the work as per time schedule.

**29.0 ROYALTY & OCTROI:**

Contractor to pay all Royalties, Octroi, Taxes etc. for the materials procured by contractor for completing the job in all respects. These costs shall be deemed to be considered in the quoted prices. No extra payment shall be considered what so ever.

**30.0 NO DUE CERTIFICATE FROM SUB CONTRACTORS AND SUPPLIERS**

Contractor to submit ‘No due certificate’ from their subcontractors, suppliers, etc. at the end of the project for clearing the final payment if he has appointed so.

**31.0 CHECK-LIST**

After completion of the work or during execution of the work, contractor shall attend checklist jobs, issued by Architect-PMC/BPCL from time to time, as per direction / instruction of Architect-PMC/BPCL.
32.0 PROVIDENT FUND

32.1 The contractor shall strictly comply with the provisions of Employees Provident Fund Act and register the establishment with the concerned Regional Provident Fund Commissioner (RPFC) before commencing the work. The contractor shall deposit "Employees" and "Employers" contributions in the designated account with the designated Authority every month. The contractor shall furnish along with each running bill, the challan/receipt for the payment of provident fund made to the RPFC for the preceding month(s).

33.0 JOB COMPLETION AND COMPLETION CERTIFICATE

33.1 "Job Completion" means when job is completed in accordance with the applicable specifications and has been structurally, mechanically and completed in all respect as set forth in the provision of the contract.

33.2 Completion Certificate:- The contractor shall be issued completion certificate upon successful completion of the contract.

34.0 FINANCIAL DETERRENTS FOR VIOLATION OF SAFETY NORMS BY CONTRACTOR

Financial Deterrent for Violation of Safety Norms by Contractors for works carried out in the Refinery has been attached with the tender. Contractor has to strictly follow safety norms as per BPCL rules and regulations. Contractors who are violating safety norms while executing the job will be penalized financially.

Following clauses (Sr. No) of Financial Deterrent for Violation of Safety Norms by Contractors for works carried out in the Refinery shall remain applicable out of this document to this work.

1. Sr. No. 4, 5, 6, 7,8,9,10,11,13,14,15,16,22,23,24,25,26,27,29,31,32,33,34,35,38,42,44,45,46,47,49,54,55,56,57,58,59
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GENERAL CONDITIONS OF CONTRACT

SECTION - I
DEFINITION OF TERMS

In the contract documents as herein defined where the context so admits, the following words and expressions will have following meanings:

1) "The Owner/Company/BPCL" means the Bharat Petroleum Corporation Limited, incorporated in India having its registered office at 4 & 6, Currimbhoy Road, Ballard Estate, Mumbai - 400 038 or their successors or assigns.

2) "The Contractor" means the person or the persons, firm or Company whose tender has been accepted by the Owner and includes the Contractor’s legal representative, his successor and permitted assigns.

3) The "Managing Director" shall mean the Chairman and Managing Director of the Bharat Petroleum Corporation Limited or his successor in office designated by the Owner.

4) The "Engineer-in-Charge" shall mean the person designated as such by the Owner and shall include those who are expressly authorised by the Owner to act for and on his behalf for operation of this contract.

5) The "Work" shall mean the works to be executed in accordance with the contract or part thereof as the case may be and shall include extra, additional, altered or substituted works as required for purpose of the contract.

6) The "Permanent Work" means and includes works which will be incorporated in and form a part of the work to be handed over to the Owner by the Contractor on completion of the contract.

7) The "Construction Equipment" means all appliances, Tools/Tackles and equipment of whatsoever nature for the use in or for the execution, completion, operation or maintenance of the work unless intended to form part of the Permanent work.

8) The "Site" means the areas on which the permanent works are to be executed or carried out and any other places provided by the Owner for purpose of the contract.

9) The “Contract Document” means collectively the Tender Document, Designs, Drawings or Specifications, agreed variations, if any, and such other document constituting the tender and acceptance thereof.

10) The "Consultant" means the consulting engineers nominated/appointed by the Owner for this Project/job.

11) The "Sub-Contractor" means any person or firm or Company (other than the Contractor) to whom any part of the work has been entrusted by the Contractor, with the written consent of the Engineer-in-Charge, and the legal personal representatives, successors and permitted assigns of such person, firm or company.

12) The "Contract" shall mean the Agreement between the Owner and the Contractor for the execution of the works including therein all contract documents.

13) The "Specification" shall mean the various technical specifications attached and referred to in the tender documents. It shall also include the latest editions, including all addenda/corrigenda, of relevant Indian Standard Specification, specifications of the other country published before entering into Contract.

14) The "Drawings" shall include maps, plans and tracings or prints thereof with any modifications approved in writing by the Engineer-in-Charge and such other drawings as may, from time to time, furnished or approved in writing by the Engineer-in-Charge.

15) The "Tender" means the tender submitted by the Contractor for acceptance by the Owner.

16) The "Alteration Order" means an order given in writing by the Engineer-in-Charge to effect additions to or deletion from and alterations in the works.

17) The "Completion Certificate" shall mean the certificate to be issued by the Engineer-in-Charge to effect additions to or deletion from and alterations in the works.

18) The "Final Certificate" in relation to a work means the certificate issued by the Engineer-in-Charge after the period of liability is over for releasing the retention money/PBG.

19) The "Period of Liability" in relation to a work means the specified period during which the Contractor stands responsible for rectifying all defects that may appear in the works.
SECTION - II  
GENERAL INFORMATION ABOUT SITE

2.1 LOCATION OF SITE & ACCESSIBILITY:

The site location is described in the Special Conditions of Contract which may be within the premises of existing Refinery. The intending tenderer should inspect the site and make himself familiar with site conditions and available facilities.

Entry into the BPCL areas is restricted depending on location/site. Only pass holders as also vehicles with special permits are permitted in such restricted areas. Inside the premises access to various work spots is also further regulated by permits issued for each area.

Non-availability of access roads or permits for entry of vehicles/equipment to any specific area shall in no case be the cause to condone any delay in execution of works or be the cause for any claims or extra compensations.

2.2 SCOPE OF WORK

The scope of work is defined in the Special Conditions of Contract and specifications. The Contractor shall provide all necessary materials, equipments / Tools and Tackles / Supervision / labour etc. for the execution and maintenance of the work till completion unless otherwise mentioned in these tender documents. All materials that go with the work shall be approved by Engineer-in-Charge prior to procurement and use.

2.3 WATER SUPPLY, POWER SUPPLY AND OWNER’S LAND FOR CONTRACTOR’S FIELD, GODOWN AND WORKSHOP:

Unless otherwise provided under Special Conditions of Contract, the tenderer will have to make his own arrangement for supply of water and power.

The tenderer should visit the site and acquaint himself with site conditions, availability of water, electricity, approach roads, construction materials as per specifications, shelter for his staff, etc. since these are to be provided/arranged by the tenderer (unless otherwise specified) at his cost.

The owner will, at his discretion and convenience based on availability for the duration of the execution of the work, make available, land for construction of contractor's field office, go-downs, workshop and fabrication yard required for the execution of the contract. The contractor shall at his own cost construct all these temporary buildings and provide suitable water supply and sanitary arrangement approved by the Engineer-in-Charge.

On completion of the works undertaken by the Contractor, he shall remove all temporary works/ shed erected by him and have the site cleaned as directed by Engineer-in-Charge if the contractor shall fail to comply with these requirements, the Engineer-in-charge may at the expenses of the Contractor remove such surplus and rubbish material, dispose off the same as he deems fit and get the site cleared as aforesaid; and the contractor shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such surplus materials disposed off as aforesaid. But the Owner reserves the right to ask the Contractor any time during the pendency of the contract to vacate the land by giving seven days notice on security reasons or on material interest otherwise.

2.4 SAFETY STANDARDS FOR TEMPORARY BUILDINGS

All temporary buildings, sheds, workshops, field stations etc. shall be constructed in conformation with the safety and security regulations of the owner as regards location and type of structure.
SUBMISSION OF TENDER:

3.1 The quotation should be submitted only in the manner and the form prescribed in the Request For Quotation (RFQ)/Tender enquiry.

3.2 Addenda/Corrigenda to this tender document if issued must be signed and submitted along with the tender document. The tenderer should consider the Addenda/Corrigenda and should price the work based on revised quantities when amendments for quantities are issued in addenda.

3.3 Tenders should always be placed in double sealed covers, superscribing Tender No. ____________ Tender for ______________(name of job), Bharat Petroleum Corporation Limited, due for opening on _____________. The full name, postal address and telegraphic address of the tenderer shall be written on the bottom left hand corner of the sealed cover. (This will not be applicable in the case of e-tenders) Tenders received in open condition (priced bid) are liable to be rejected.

3.4 Instructions for two part bidding

i) The bid should be submitted in two parts viz.
   a. Techno-commercial bid.
   b. Price bid.

ii) Techno-commercial bid shall have the following information/details
   a. Technical deviation if any.
   b. Commercial deviation if any like extra taxes, duties etc.
   c. Copy of price bid with prices blanked off.
   d. Any other relevant information.

iii) Price Bid shall have only prices as per schedule of Rates.

iv) Techno-commercial bid and price bid shall be enclosed in two separate envelopes with the subject job, type of bid, bidders name super-scribed on top. Both these envelopes shall be sealed in a common envelope and submitted as specified above and in covering letter. (This will not be applicable in the case of e-tenders)

DOCUMENTS:

4.1 The tenders, as submitted shall include all documents/details asked for by BPCL in the RFQ/Tender enquiry.

4.2 All pages to be initialed:

Wherever signed tender documents are submitted, all signatures in the documents shall be dated, as well as all the pages of the documents shall be initialed at the lower right hand corner and signed wherever required in the tender papers by the tenderer or by a person holding power of attorney authorizing him to sign on behalf of the tenderer before submission of tender. Tenders without signatures as stated above are liable to be rejected.

4.3 Rates to be in Figures and Words:

The tenderer should quote the rates in English both in figures as well as in words. Offers received without the rates in figures and in words are liable for rejection. In case of discrepancy exists between the rate quoted in figures and in words, the rates quoted in words will prevail.

4.4 Corrections and Erasures:

All corrections and alteration in the entries of tender papers will be signed in full by the tenderer with date. No erasures or over-writings are permissible.

In case of priced bids containing overwriting/cuttings/erasures in the quoted rates and in case these are not attested by the signatory of the bid, such priced bids are liable to be rejected without giving any further notice.

4.5 Signature of Tenderer:

The tender shall contain the name, residence and place of business of person or persons making the tender and shall be signed by the tenderer with his usual signature with company stamp. Partnership firms shall furnish the full names of all partners in the tender. It should be signed in the partnership name by all the partners or by duly authorized representative followed by the name and designation of the person signing with company stamp. Tender by Company or Corporation registered under the relevant companies act, shall be signed by the authorized representative and a power of attorney in that behalf shall accompany the tender.

4.6 Transfer of tender documents issued to one intending tenderer to another is not permissible.
PURCHASE PREFERENCE:

Owner reserves its right to allow Public Sector Enterprises (Central/State), purchase preference as admissible/applicable from time to time under the existing Govt. policy.priced.

Owner reserves its right to allow Micro and Small Enterprises (MSEs) and MSEs owned by Scheduled Caste (SC) or the Scheduled tribe (ST) entrepreneurs, purchase preference as admissible/applicable from time to time under the existing Govt. policy.

EARNEST MONEY:

(a) The tenderer must submit/ deposit earnest money, if specified in the RFQ/Tender enquiry, failing which the tender is liable to be rejected. Earnest Money Deposit shall be submitted in the form of crossed Demand Draft in favour of "Bharat Petroleum Corporation Ltd." / Electronic Funds Transfer to BPCL Bank Account / Bank Guarantee executed by any Scheduled Bank approved by Reserve Bank of India (as per Proforma provided in Annexure 2). Earnest Money Deposit (EMD) shall be valid for a period of 6 (Six) months from the due date of opening of Techno-commercial Bids and shall be submitted from any Indian Scheduled Commercial Bank / Indian Branch of Foreign Bank. EMD submitted by foreign vendors shall be in USD / EURO only.

In case of limited tender, Earnest Money deposit (EMD) is not applicable for registered contractors of BPCL.

NOTE : Exemption of Bidding Document fee and EMD will be applicable for Micro and Small Enterprises (MSEs) registered with National Small Industries Corporation (NSIC)/ District Industries Centers (DIC) as per applicable government guidelines . Such bidder shall submit Notary attested copy of the certificate issued by NSIC or DIC, valid as on the date of bid opening, indicating that their registration includes the items/works under tender. The registration certificate should remain valid during the period of the contract that may be entered into such successful bidder. Such tenderers should ensure validity of the Registration Certificate for the purpose.

NOTE: No interest shall be paid by the Owner on the earnest money deposit by the tenderer. The earnest money of the unsuccessful tenderer will be refunded after the completion of BQC evaluation / Technical Evaluation / Priced Bid Evaluation as applicable.

(b) CONVERSION OF EMD TO SECURITY DEPOSIT:

The earnest money deposit (EMD) of the contractor whose tender may be accepted, if paid in forms other than Bank Guarantee, can be converted to security deposit for due performance of the contract if the contractor so desires. The "performance security deposit/retention money" vide clause 18 shall also be applicable limiting to a maximum of 10% of the contract value.

TENDER VALIDITY:

Tender submitted by tenderers shall remain valid for acceptance for a period of four months from the date of opening of the tender (Technical Bid in the case of two bid). The tenderer shall not be entitled during the said period of four months, without the consent in writing of the Owner, to revoke, or cancel his tender or vary the tender given or any term thereof.

In case of tenderer revoking or canceling his tender, varying any terms in regard thereof without prior consent of Owner in writing, appropriate penal action will be taken by BPCL as deemed fit including putting the tenderer/contractor on 'Holiday listing'/Delisting' barring the tenderer/contractor from participating in future tenders for an appropriate period from the date of revocation/cancellation/varying the terms besides forfeiture of Earnest Money deposited by tenderer.

FIRMNESS OF QUOTE :

Once the quotation is accepted, the rates quoted shall be firm till the entire work is completed.

LANGUAGE OF BID:

The Bid, all correspondence and documents relating to the bid, between Bidder and BPCL, shall be written in English language only. Any supporting document furnished by Bidder may be written in other language provided that this literature is accompanied by an authenticated English translation in which case, for purpose of interpretation of the Bid, the English translation shall govern.
7.C  **CURRENCIES OF BID & PAYMENT:**
For materials and services to be procured from India, Bidder shall quote the prices in INR only.

Indian bidders shall quote the rates/prices in Indian Rupees (INR) only for Indian component and in USD / EURO for Foreign Component. Foreign Bidders can quote their prices in INR / USD / EURO. Payment shall be subject to RBI guidelines.

8  **ADDENDA / CORRIGENDA:**
Addenda/ Corrigenda to the tender documents may be issued prior to the date of opening of the tenders to clarify documents or to effect modification in the design or tender terms. All addenda/corrigenda issued shall become part of tender Document.

9  **RIGHT OF OWNER TO ACCEPT OR REJECT TENDER:**

9.1 The right to accept the tender will rest with the Owner. The Owner, however, does not bind itself to accept the lowest tender, and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever.

9.2 The whole work may be split up between two or more contractors or accepted in part and not entirely if considered expedient.

9.3 Tenders in which any of the particulars and prescribed informations are missing or are incomplete in any respect and/or the prescribed conditions are not fulfilled are liable to be rejected.

9.4 Canvassing in connection with tenders is strictly prohibited and tenders submitted by the tenderer who resort to canvassing will be liable to rejection.

9.5 Tender containing uncalled remarks or any additional conditions are liable to be rejected.

10 A  **INTEGRITY PACT (IP):**

Vendors are requested to sign & return IP document, attached as Annexure 7, if applicable as per the terms of the tender. This document is essential & binding.

Proforma of Integrity Pact shall be returned by the Bidder along with the bid documents (Technical Bid), duly filled up and signed by the same signatory who is authorized to sign the bid documents. All the pages of the Integrity Pact shall be duly signed. Bidder’s failure to return the Integrity Pact duly signed along with the bid documents may result in the bid not being considered for further evaluation.

If the Bidder has been disqualified from the tender process prior to the award of the contract in accordance with the provisions of the Integrity Pact, BPCL shall be entitled to demand and recover from Bidder Liquidated Damages amount by forfeiting the EMD/ Bid Security as per provisions of the Integrity Pact.

If the contract has been terminated according to the provisions of the Integrity Pact, or if BPCL is entitled to terminate the contract according to the provisions of the Integrity Pact, BPCL shall be entitled to demand and recover from Contractor Liquidated Damages amount by forfeiting the Security Deposit/ Performance bank Guarantee as per provisions of the Integrity Pact.

Bidders may raise disputes/ complaints, if any, with the nominated Independent External Monitor.

10 B  **HOLIDAY LISTING:**

The vendors / contractors are expected to adopt the ethics of highest standards and a very high degree of integrity, safety and quality consciousness, commitment and sincerity towards the work undertaken and dealing with BPCL in such matters. Also, while participating in the tender and performing the contracts, Contractors are required to meet certain performance criteria and adherence to the terms and conditions of the tender / contract.

BPCL shall have the right to remove from the list of approved suppliers / contractors or to ban business dealings, if any agency has been found to have committed misconduct or fraud or poor performance or anything unethical not expected from a reputed agency.

The guidelines and procedures for Holiday Listing as adopted by BPCL and available separately in BPCL website shall be applicable in the context of all tenders floated and consequently, all Orders / Contracts / Purchase Orders placed, by BPCL.

10 C  **CONSULTANCY CONTRACTS:**

This General Conditions of Contract (GCC) will be binding for Consultancy jobs only to the extent of its applicability to the context of consultancy jobs.
FOREIGN BIDDERS:

It is mandatory for the foreign bidder to furnish the documents for the compliance to requirement of PAN No., Tax Residency Certificate and Form No.10F (applicable for foreign bidder in case of services in India is required as per scope of bidding document) as per Income Tax Act in case his receipts are subject to tax deduction at source in India:

(a) PAN No.

PAN as per the Indian Income Tax requirements shall be submitted, failing which the Supplier/Contractor/Consultant shall be responsible for any additional tax deduction at source as per the provisions of the Indian Income Tax Act/Rules and the same shall be deducted from the payment made to supplier/contractor/consultant.

(b) Tax Residency Certificate (TRC)

TRC containing prescribed particulars as per the Annexure 5 from the Government of foreign country in order to claim the benefits of DTAA as per the Indian Income Tax requirements shall be submitted, failing which the relief under DTAA will not be available and consequently the actual rate of withholding tax will be applicable and deducted from the payment made to supplier/contractor/consultant (i.e., non-resident taxpayer). The TRC shall be duly verified by the Government of the country of which the assessee claims to be a resident for the purposes of tax.

(c) Form 10F

In additional to TRC, in order to claim the benefits of DTAA, bidder shall also submit additional information in form no. 10F as per Annexure 6. Form 10F has to be signed & verified by the assessee himself.

The above shall be furnished before release of any payment or within one month of the release of Order, whichever is earlier. In case of failure to submit the above information, any additional tax liability on Owner, will be deducted from the payment due to the contractor.

COLLECTION OF DATA TENDERER’S RESPONSIBILITY:

The tenderer shall visit the site and acquaint himself fully of the site and no claims whatsoever will be entertained on the plea of ignorance or difficulties involved in execution of work or carriage of materials.

TIME SCHEDULE:

The time period allowed for carrying out the job shall be as shown in tender document. Request for revision for time schedule after tenders are opened will not be received for consideration.

SIGNING OF THE CONTRACT:

The successful tenderer shall be required to execute an agreement in the proforma attached with tender enquiry within a period of one month of the receipt by him of the notification of acceptance of tender. The payment will not be processed till the time the agreement is executed.

FIELD MANAGEMENT:

The field management will be the responsibility of the Engineer-in-Charge, who will be nominated by the Owner. The Engineer-in-Charge may also authorize his representatives to perform his duties and functions. Coordination of Work - The Engineer-in-Charge shall coordinate the work of various agencies engaged at site to ensure minimum disruption of work carried out by different agencies. It shall be the responsibility of the contractor to plan and execute strictly in accordance with the site instructions to avoid hindrance to the works being executed by other agencies.

RETIRED GOVERNMENT OR COMPANY OFFICER:

No Engineer of Gazetted rank or other Gazetted Officer, employed in Engineering or Administrative duties in an Engineering Department of the States/Central Government or of the Owner is allowed to work as a Contractor for a period of two years after his retirement from Government service or from the employment of the Owner without the previous permission of the Owner. The contract, if awarded, is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person, who had not obtained the permission of the State/ Central Government, or of the Owner as aforesaid before submission of tender, or engagement in the Contractor’s service as the case may be.
15 INTERPRETATION OF CONTRACT DOCUMENT:

15.1 Except if and to the extent otherwise provided by the Contract, the provisions of the General Conditions of Contract and special conditions shall prevail over those of any other documents forming part of the contract. Several documents forming the contract are to be taken as mutually explanatory. Should there be any discrepancy, inconsistency, error or omission in the contract or any of the matter may be referred to Engineer-in-Charge, who shall give his decisions and issue to the Contractor instructions directing in what manner the work is to be carried out. The decision of the Engineer-in-Charge shall be final and conclusive and the contractor shall carry out work in accordance with this decision.

15.2 Works shown upon the drawing but not mentioned in the specifications or described in the specification without being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.

15.3 Headings and marginal notes to the clauses of these General Conditions of Contract or to specifications or to any other tender document are solely for the purpose of giving a concise indication and not a summary of the content thereof, and they shall never be deemed to be part thereof or be used in the interpretation or construction thereof of the Contract.

15.4 Singular and Plural: In these contract documents unless otherwise stated specifically, the singular shall include the plural and vice-versa wherever the context so requires. Words indicating persons shall include relevant incorporated companies/registered as associations/body of individual/firm or partnership.

16 SPECIAL CONDITIONS OF CONTRACT:

16.1 Special Conditions of contract shall be read in conjunction with the General Conditions of Contracts, specification of work, Drawings and any other documents forming part of this contract wherever the context so requires.

16.2 Notwithstanding the sub-division of the documents into these separate sections and volumes every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.

16.3 Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract then, unless a different intention appears the provisions of the Special Conditions of Contract shall be deemed to over-ride the provision of the General Conditions of Contract and shall to the extent of such repugnance or variations, prevail.

16.4 Wherever it is mentioned in the specifications that the Contractor shall perform certain work or provide certain facilities, it is understood that the contractor shall do so at his own cost.

16.5 The materials, designs and workmanship shall satisfy the relevant Indian Standards, the Job specifications contained herein and codes referred to. Where the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.

17 CONTRACTOR TO OBTAIN HIS OWN INFORMATION:

The contractor in fixing rate shall for all purposes whatsoever be deemed to have him self independently obtained all necessary information for the purpose of preparing his tender. The contractor shall be deemed to have examined the Contract Documents, to have generally obtained his own information in all matters whatsoever that might affect the carrying out the works at the scheduled rates and to have satisfied himself to the sufficiency to his tender. Any error description of quantity or omission there from shall not vitiate the contract or release the Contractor from executing the work comprised in the contract according to drawing and specifications at the scheduled rates. He is deemed to have known the scope, nature and magnitude of the works and the requirements of materials and labour involved etc. and as to what all works he has to complete in accordance with the contract documents whatever be the defects, omissions or errors that may be found in the Contract Documents. The Contractor shall be deemed to have visited surrounding to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of the Railways, roads, bridges and culverts means of transport and communications, whether by land, water or air, and as to possible interruptions thereto and the access to and regress from the site, to have made enquiries, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials the available accommodation as to whatever required, depots and such other building as may be necessary for executing and completing the works, to have made local independent enquiries as to the sub-soil water and variations thereof, storms, prevailing winds, climate conditions and all other similar matters affecting these works. He is deemed to have acquainted himself as to his liability for payment of Government taxes, customs duty and other charges. Any neglect or failure on the part of the Contractor in obtaining necessary and reliable information upon the foregoing or any other matters affecting the contract shall not relieve him from any risk or liabilities or the entire responsibility from completion of the works at the scheduled rates and time in strict accordance with the contract documents.
No verbal agreement or inference from conversation with any officer or employee of the owner either before or after the execution of the contract agreement shall in any way affect or modify any of the terms or obligations herein contained.

**SECURITY DEPOSIT TOWARDS PERFORMANCE/RETENTION MONEY:**

18.1 To ensure performance of the contract and due discharge of the contractual obligations, the successful contractor will have to provide security deposit of 10% of the contract value within 30 days of receipt by him of the notifications of acceptance of tender unless otherwise specified in the Special Conditions of Contract.

This Security deposit may be furnished in the form of an Account payee Demand Draft payable to BPCL or Bank Guarantee in the prescribed format. The contractor shall have the option to adjust any Earnest Money Deposit-(EMD), if paid in forms other than Bank Guarantee, towards security deposit if he so desires.

In the case of security deposit submitted in the form of Bank guarantee, the Bank Guarantee shall be valid and remain in force till the completion of contractual completion period, defect liability period (if applicable) plus a claim period of 3 months. The Bank Guarantee shall be in the form prescribed (Annexure 2).

The security deposit will be retained till the successful completion of the work and thereafter till the expiry of the defect liability period (refer clause-72), if applicable. This retention money/Bank guarantee held shall be released after the expiry of the defect liability period provided that any defects appearing during that period are corrected by the contractor and subject to Clause 18.2 below.

If the Contract Value is in more than one currency, the Security deposit shall also be in multiple currencies amounting to 10% for each currency of awarded contract.

In the case of value/rate/quantity contracts, the security deposit shall be based on individual release orders issued.

18.2 If the contractor/ sub-contractor or their employees shall break, deface or destroy any property belonging to the Owner or other agency during the execution of the contract, the same shall be made good by the Contractor at his own expenses and in default thereof, the Engineer-in-Charge may cause the same to be made good by other agencies and recover expenses from the contractor (for which the certificate of the Engineer-in-Charge shall be final). These expenses can be recovered from the security deposit/retention money if recovery from other sources is not possible.

18.3 All compensation or other sums of money payable by the contractor to the Owner under terms of this contract may be deducted from his security deposit/retention money or from any sums which may be or may become due to the contractor by the Owner on any account whatsoever and in the event of his security deposit/retention money being reduced by reasons of any such deductions. The contractor shall within ten days thereafter make good any sum or sums, which may have been deducted from his security Deposit/retention money. No interest shall be payable by the Owner from sum deposited as security deposit/retention money.

18.4 The security deposit shall be held by the Owner, as security for the due performance of the Contractor’s obligations under the contract, provided that nothing herein stated shall make it incumbent upon the Owner to utilize the security deposit/retention money in preference to any other remedy which the Owner may have, nor shall be construed as confining the claims of the Owner against the contractor to the quantum of the Security Deposit/retention money.

18.5 The Bank guarantee if submitted shall be from any Indian scheduled bank or an international bank of repute having a branch in India or a corresponding banking relationship with an Indian scheduled bank. The security deposit/retention money shall be in Indian Rupee in the case of domestic bidders and in the quoted currency in the case of foreign bidders (INR/USD/EURO as the case may be.).

**TIME OF PERFORMANCE:**

19.1 The work covered by this contract shall be commenced as detailed in the purchase order or as per the instructions of the Engineer in charge and be completed in stages on or before the dates as mentioned in the time schedule of completion of work. The contractor should bear in mind that time is the essence of this agreement unless such time
be extended pursuant to the provision of clause No. 21. Request for revision of Completion time after tenders are opened will not receive consideration.

19.2 Time Schedule of Completion: The general time schedule of completion is given in the tender document. Contractor should prepare a detailed monthly and weekly execution programme, jointly with the Engineer-in-Charge within two weeks of receipt of Letter of Intent or acceptance of tender. The work shall be executed strictly as per the time schedule given in this document. The period of completion given includes the time required for testing, rectifications, if any, retesting and completion in all respects to the entire satisfaction of the Engineer-in-Charge.

20 FORCE MAJEURE:

Any delays in or failure of the performance of either party hereto shall not constitute default hereunder or give rise to any claims for damages, if any, to the extent such delays or failure of performance is caused by occurrences such as Acts of God or the public enemy expropriation or confiscation of facilities by Govt./authorities, compliances with any order or request of any Government authorities, acts of war, rebellion or sabotage or fires, floods, explosions, riots or strikes. The contractor shall keep records of the circumstances referred to above and bring these to the notice of Engineer-in-Charge in writing immediately on such occurrences.

21 EXTENSION OF TIME:

If the contractor shall desire an extension of the time for completion of the work on the grounds of his having been unavoidably hindered in its execution or on any other grounds, he shall apply in writing to the Engineer-in-Charge within two weeks of the date of hindrance on account of which he desires such extension as aforesaid, and the Engineer-in-Charge shall if in his opinion (which shall be final), reasonable grounds have been shown thereof, authorize such extension of time as may in his opinion be necessary or proper.

In the event of extension of Time of the contract, if granted, the contractor shall be required to suitably extend the period of Bank Guarantee if submitted, towards security Deposit/retention money suitably.

22 LIQUIDATED DAMAGES FOR DELAY:

22.1 Time is the essence of the contract. In case the contractor fails to complete the whole work within the stipulated period, he shall be liable to pay liquidated damages of 0.5% of the value of contract per week and or part thereof of the delay subject to a maximum of 5% of the value of the contract. The parties agree that this is a genuine pre-estimate of the loss/damage which will be suffered by the owner on account of delay on the part of the contractor and the said amount will be payable on demand without there being any proof of the actual loss or damages having been caused by such delay/breach. The owner shall be at liberty to adjust or deduct the said amount of liquidated damages from any amount due to the contractor including Security Deposit.

22.2 The owner shall be at liberty to deduct or retain from any amount payable to the contractor periodically, the proportionate or full amount of liquidated damages as the case may be for the delay periodically caused by the contractor.

23 SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDERED AS REASONABLE COMPENSATION WITHOUT REFERENCE TO ACTUAL LOSS:

All sums payable by way of compensation under any of the conditions shall be considered as reasonable compensation without reference to the actual loss or damage, which shall have been sustained by the Owner.

24 TERMINATION/OFFLOADING:

24.1 The contractor fully understands that timely completion of the work as per the schedule is of paramount necessity as otherwise it would lead to adversely affecting the schedules of other works/project with resultant financial and other losses to the Company/owner. In view of this, the contractor unconditionally agrees and binds himself to be liable for all the consequences for non-completion of the work within the stipulated time.

24.2 In case a situation is brought about by the contractor warranting termination/off-loading of the whole or any part of the work for any reason whatsoever, the Company/owner shall have the liberty and right to entrust/engage/award the work so terminated/off loaded at the risk and cost of the contractor to any other agency/contractor by adopting any mode of inviting tenders, i.e. open/limited/single party/negotiation basis etc. in order to ensure completion of the work as per the schedule or at the quickest possible time.

25 FORFEITURE OF SECURITY DEPOSIT:

Whenever any claim against the Contractor for the payment of a sum of money arises out of or under the contract, the Owner shall be entitled to recover such sum by appropriating in part or whole, security deposit of the contractor, forming whole or part of such security being insufficient or if no security has been taken from the Contractor then the balance or the total sum recoverable, as the case may be, shall be deducted from any sum then due or which at any time thereafter may become due to the Contractor. The contractor shall pay to the owner on demand any balance remaining due.
ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED:

In any case in which, under any clause or clauses of this contract, the contractor shall have forfeited the whole of his security deposit (whether paid in one sum or deducted by installment) or have committed a breach of any of the terms contained in this contract the owner shall have power to adopt any of the following courses as he may deem best suited to his interest.

a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the owner shall be conclusive evidence) in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the Owner.

b) To employ labour paid by the owner and to supply materials to carry out the work any part of the work, debiting contractor with the labour cost of tools and plants and equipment charges, the cost of the materials for which a certificate of the Engineer-in-Charge shall be final and conclusive against the Contractor and 10% of costs as above to cover all departmental charges and crediting him with the value of the work done in all respects in the manner and at the same rates as if it had been carried out by the Contractor under the term of his contract. The certificate of Engineer-in-Charge as to the value of the work done shall be final and conclusive against the contractor.

c) To measure up the work of the contractor and to take such part thereof as shall be unexecuted out of his hand to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess, the certificate in writing of the Engineer-in-Charge shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by the Owner under the contract or otherwise from his security deposit or from the proceeds of sale thereof, of a sufficient part thereof.

In the event of any of the above course being adopted by the Owner, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any agreements or made any advances on account of or with a view to the execution of the work of the performance of the contract. In case the Contractor shall not be entitled to recover or be paid any sum for any work actually performed under this contract unless the Engineer-in-Charge will certify in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CONTRACTOR REMAINS LIABLE TO PAY COMPENSATION IF ACTION NOT TAKEN UNDER CLAUSE 26:

In any case in which any of the powers conferred upon the owner by clause 26 thereof shall have become exercisable and the same had not been exercised, the non exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercised in the event of any further case of default by the contractor for which any clause hereof he is declared liable to pay compensation amounting to the whole of his security deposit and the liability of the contractor for past and future compensation shall remain unaffected. In the event of the Owner putting in force the power under sub-clause (a), (b) or (c) of clause 26 vested in him under the proceeding clause he may, if he so desires possession of all or any tools and plants materials and stores in or upon the works or the site thereof belonging to the contractor or procured by him and intended to be used for the execution of the work or any part thereof paying or allowing for the same in account at the contract rates or in case of these not being applicable at current market rates to be certified by the Engineer-in-Charge whose certificate thereof shall be final otherwise the Engineer-in-Charge may give notice in writing to the contractor or his clerk of the works, supervisor or other authorized agent, requiring him to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice) and in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractors expense or sell them by auction or private sale on account of the contractor and at his risk in, all respects without any further notice as to the date, time or place of sale and the certificate of the Engineer-in-Charge as to the expense of any such removal and the amount of proceeds and any expenses of any such sale shall be final and conclusive against the contractor.

NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK:

If at any time from the commencement of the work the owner shall for any reasons whatsoever, not require the whole or part thereof as specified in the tender to be carried out, the Engineer-in-Charge shall give notice in writing of the fact to the contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out, neither shall he have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.
29 CHANGES IN CONSTITUTION OF THE CONTRACTOR:

The Contractor, whether an individual, Proprietary Concern, Hindu Undivided Family, Partnership Firm, Private Limited Company or Public Limited Company, shall not make any change(s) in its constitution, by transfer of substantial shareholding or of management (in case of a company) or by addition or deletion of Partners, change in the terms of Partnership, or make any other material change(s) without prior approval of Owner. Any such unauthorized change shall attract the provisions of clause 35 hereof.

30 IF THE CONTRACTOR DIES:

Without prejudice to any of the rights or remedies under his contract, if the contractor (if an individual) dies, the Owner shall have the option of terminating the contract without compensation to the contractor.

31 EMPLOYEES OF THE OWNER NOT INDIVIDUALLY LIABLE:

No director or official or employee of the Owner shall in any way be personally bound or liable for the acts or obligations of the Owner under the contract or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

32 OWNER NOT BOUND BY PERSONAL REPRESENTATIONS:

The contractor shall not be entitled to any increase on the item rates of the contract or any other right or claim whatsoever by reason of representation, explanation or statement or alleged representation, promise or guarantees given or alleged to have been given to him by any person.

33 CONTRACTOR’S OFFICE AT SITE:

The contractor shall provide and maintain an office at the site, if space provided by the owner, for the accommodation of his agent and staff and such office shall be open at all reasonable hours to receive instruction, notices, or other communications.

34 CONTRACTOR’S SUBORDINATE STAFF AND THEIR CONDUCTS:

34.1 The contractor, on or after award of the work shall name and depute a qualified personnel having sufficient experience in carrying out work of similar nature to whom the equipments materials, if any, shall be issued and instructions for works given. The contractor shall also provide to the satisfaction of the Engineer-in-Charge sufficient and qualified staff to supervise the execution of the works, competent sub-agents, supervisor and leading hands including those specially qualified by previous experience to supervise the type of works comprised in the contract in such manner as will ensure work of the best quality, expeditious working. Whenever in the opinion of the Engineer-in-Charge, additional properly qualified supervision staff is considered necessary, they shall be employed by the contractor without additional charges on account thereof. The Contractor shall ensure to the satisfaction of the Engineer-in-Charge that sub-contractors, if any shall provide competent and efficient supervision over the work entrusted to them.

34.2 If and whenever any of the Contractor’s or sub-contractor’s agents, sub-agents, assistants supervisor or other employees shall in the opinion of Engineer-in-Charge be guilty of any misconduct or be incompetent or insufficiently qualified or negligent in the performance of their duties or that in the opinion of the owner or Engineer-in-Charge, it is undesirable for administrative or any other reason for such person or persons to be employed in the works, the contractor, if so directed by the Engineer-in-Charge, shall at once remove such person or persons from employment thereon. Any person or persons so removed from the works shall not again be employed in connection with the works without the written permission of the Engineer-in-Charge. Any person so removed from the works shall be immediately replaced at the expense of the contractor by a qualified and competent substitute. Should the contractor be requested to repatriate any person removed from the works he shall do so and shall bear all costs in connection herewith.

34.3 The contractor shall be responsible for the proper behaviour of all the staff, supervisor, workmen and others and shall exercise a proper degree of control over them and in particular, and without prejudice to the said generality, the contractor shall be bound to prohibit and prevent any employees from trespassing or acting in any way detrimental or prejudicial to the interest of the community or of the properties or occupiers of land and properties in the neighborhood and in the event of such employee so trespassing, the contractor shall be responsible therefore and relieve the Owner of all consequent claims or actions for damages or injury or any other grounds whatsoever. The decision of the Engineer-in-Charge upon any matter arising under this clause shall be final. Contractor shall ensure that none of their employees are ever engaged in any anti-national activities.

34.4 All contractor’s personnel entering upon the Owner’s premises shall be properly identified by badges issued by owner which must be worn all times on Owner’s premises.
**SUB-LETTING OF WORK:**

Sub letting of contracts shall not be generally permitted. However owner may permit sub letting of work on specific cases subject to the following:-

i) No part of the contract nor any share of interest there shall in any manner or degree be transferred assigned sublet by the contractor directly or indirectly to any firm or corporation whatsoever except as provided for in the succeeding sub-clause, without the consent in writing of the Owner.

ii) Sub Contractors for Temporary Works Etc.:- The Owner may give written consent to sub-contract for execution of any part of the works at the site, being entered into by the contractor provided each individual sub-contract is submitted to the Engineer-in-Charge before being entered into and is approved by him.

iii) List of Sub-Contractors to be supplied: - At the commencement of every month the contractor shall furnish to the Engineer-in-Charge list of all sub-contractors or firms engaged by the contractor and working at the site during the previous month with particulars of the general nature of the sub-contract or works.

iv) Contractor's Liability Not Limited By Sub-Contractors:- Notwithstanding any sub-letting with such approval as aforesaid and notwithstanding that the Engineer-in-Charge shall have received copies of any sub-contracts, the contractor shall be and shall remain solely responsible for the quality and proper and expeditious execution of the works and the performance of all the conditions of the contract in all respects as if such sub-letting or sub-contracting had not taken place and as if such work had been done directly by the Contractor.

v) Owner may Terminate Sub-Contracts:- If any sub-contractor engaged upon the works at the site executes any work which in the opinion of the Engineer-in-Charge is not in accordance with the Contract documents, the owner may by written notice to the contractor request him to terminate such sub-contract and the contractor upon the receipt of such notice shall terminate such sub contract and the latter shall forthwith leave the works, failing which the owner shall have right to remove such sub-contractors from the Site.

vi) No Remedy For Action Taken Under This Clause:- No action taken by the owner under the clause shall relieve the contractor of any of his liabilities under the contract or give rise to any right to compensation, extension of time or otherwise failing which, the owner shall have right to remove such sub-contractors from the Site.

**POWER OF ENTRY:**

If the contractor shall not commence the work in the manner previously described in the contract document or if he shall, at any time in the opinion of the Engineer-in-Charge:

i. Fail to carry out the works in conformity with the contract documents, or

ii. Fail to carry out the works in accordance with the time schedule, or

iii. Substantially suspend work or the works for a period of Fourteen days without authority from the Engineer-in-Charge, or

iv. Fail to carryout and execute the works to the satisfactions of the Engineer-in-Charge, or

v. Fail to supply sufficient or suitable construcional equipments, temporary works, labour materials or things, or

vi. Commit or suffer or permit any other breach of any of the provisions of the contract on his part to be performed or observed or persist in any of the above mentioned breaches of the contract for the fourteen days, after notice in writing shall have been given to the Contractor by the Engineer-in-Charge requiring such breach to be remedied, or

vii. Abandon the works, or

viii. During the continuance of the contract, become bankrupt, make any arrangement or composition with his creditors, or permit any execution to be levied or go into liquidation whether compulsory or voluntary not being merely a voluntary liquidation for the purpose of amalgamation or reconstruction.

Then in any such case, the Owner shall have the power to enter upon the works and take possession thereof and of the materials, temporary works, constructional equipment, and stock thereon, and to revoke the contractor's license to use the same, and to complete the works, by his agents, other contractor or workmen, or to re-let the same upon any terms and to such other person firm or corporation as the Owner in his absolute discretion may think proper to employ and for the purpose aforesaid to use or authorize the use of any materials, temporary works constructional equipment, and stock as aforesaid without making payment or allowances to the contractor for the said materials other than such as may be certified in writing by the Engineer-in-Charge to be reasonable, and without making any payment or allowance to the contractor for the use of the temporary said works, constructional equipments and stock or being liable for any loss of damage thereto, and if the Owner shall by reason of his taking possession of the works or of the works being completed by other contractors (due account being taken of any such extra work or works which may be omitted) then the amount of such excess as certified by the Engineer-in-Charge shall be deducted from any money which may be due for work done by the contractor under the contract and not paid for. Any deficiency shall forthwith be made good and paid to the Owner by the contractor and the Owner shall have power to sell in such manner and for such price as he may think fit all or any of the constructional equipment, materials etc. belonging to and to recoup and retain the said deficiency or any part thereof out of the proceeds of the sale.

**CONTRACTOR'S RESPONSIBILITY WITH OTHER AGENCIES:**

Without repugnance to any other condition, it shall be the responsibility of the contractor executing the work, to work in close co-operation and co-ordinate the works with other contractors or their authorized representatives and
the contractor will put up a joint scheme, showing the arrangements, with other contractors / agencies for carrying
his portion of work to the Engineer-in-Charge, and get the approval. The contractor before finally submitting the
schemes to the Engineer-in-Charge shall have the written agreement of the other agencies. The Engineer-in-Charge
before communicating his approval of the scheme, with any required modifications shall get the final agreement of
all the agencies, which shall be binding. No claim shall be entertained on account of the above.

The contractor shall conform in all respects with the provisions of any statutory regulations, ordinances or by laws
of any local or duly constituted authorities or public bodies which may be applicable from time to time to the works
or any temporary works. The contractor shall keep the Owner Indemnified against all penalties and liabilities of
every kind arising out of non-adherence to such statutes ordinances, laws, rules, regulations, etc.

OTHER AGENTS AT SITE:

The contractor shall have to execute the work in such place and condition where other agencies might also be
engaged for other works such as site grading, filling and leveling, electrical and mechanical engineering works etc.
No claim shall be entertained to works being executed in the above circumstances.

NOTICES:

Any notice hereunder may be served on the contractor or his duly authorized representative at the job site or may
be served by registered mail or speed post direct to the address furnished by the Contractor. Proof of issue of any
such notice could be conclusive of the contractor having been duly informed of all contents therein.

RIGHTS OF VARIOUS INTERESTS:

i) The Owner reserves the right to distribute the work between more than one contractor. The contractor shall co-
operate and afford other contractors reasonable opportunity for access to the works for the carriage and storage of
materials and execution of their works.

ii) Whenever the work being done by any department of the Owner or by other contractors employed by the
Owner is contingent upon work covered by the contract, the respective rights of the various interests involved shall
be determined by the Engineer-in-Charge to secure the completion of the various portions of the work in general
harmony.

RIGHT OF OWNER TO DETERMINE / TERMINATE CONTRACT

i) Owner shall, at any time be entitled to determine and terminate the contract, if in the opinion of the Owner the
cessation of the work becomes necessary owing to paucity of funds or for any other cause whatsoever, in which
case, the cost of approved materials at the site at current market rates as verified and approved by Engineer-in-
Charge and of the value of the work done to date by the contractor shall be paid for in full at the rates specified in
the contract. A notice in writing from the Owner to the contractor of such determination and termination and the
reason thereof, shall be the conclusive proof of the fact that the contract has been so determined and terminated
by the Owner.

ii) Should the contract be determined under sub-clause (i) of this clause and the contractor claims payments to
compensate expenditure incurred by him in the expectation of completing the whole of the work, the Owner shall
consider and admit such claim as are deemed fair and reasonable and are supported by vouchers to the satisfaction
of the Engineer-in-Charge. The Owner’s decision on the necessity and propriety of any such expenditure shall be
final and conclusive and binding on the contractor.

PATENTS AND ROYALTIES:

42.1 The contractor, if licensed under any patent covering equipment, machinery, materials or compositions of matter to
be used or supplied or methods and process to be practiced or employed in the performance of this contract,
agrees to pay all royalties and licence fees which may be due with respect thereto. If any equipment, machinery,
materials or composition matters, to be used or supplied or methods and process to be practised or employed in
the performance of this contract, is covered by a patent under which contractor is not licensed then the contractor
before supplying or using the equipment, machinery, materials, compositions method or processes shall obtain such
licences, and pay such royalties and licence fees as may be necessary for performance of the contract. In the
event, the contractor fails to pay any such royalties or obtain any such licence, any suit for infringement of such
patents which is brought against the contractor or the Owner as a result of such failure will be defended by the
contractor at his own expenses and the contractor will pay any damages and costs awarded in such suit. The
contractor shall promptly notify the owner if the contractor has acquired knowledge of any patent under which a
suit for infringement could be reasonably brought because of the use by the Owner of any equipment, machinery,
materials, and process methods to be supplied hereunder. The contractor agrees to and does hereby grant to
Owner, together with the right to extend the same to any of the subsidiaries of the Owner as irrevocable, royalty-
free licence to use in any country, any invention made by the contractor or his employee in or as a result of the
performance of the work under the contract.
The Owner shall indemnify and save harmless the contractor from any loss on account of claims on contractor for
the contributory infringement of patent rights arising out and based upon the claim that the use by the Owner of
the process included in the design prepared by the Owner and used in the operation of the plant infringes on any
patent right with respect to any sub-contract entered into by contractor pursuant to the provisions of sub-
contractor an undertaking to provide the Owner with the same patent protection that contractor is required to
provide under the provisions of this clause.

42.2 All drawings, blue prints, tracings, reproducible, models, plans, specification and copies thereof, furnished by the
Owner as well as drawings, tracings, reproducible, plans specifications, design, calculations etc. prepared by the
contractor for the purpose of execution of works covered in or connected with this contract shall be the property of
Owner and shall not be used for any other work but are to be delivered to the Owner at the completion of the
contract.

42.3 Where so desired by Engineer-in-Charge, the contractor agrees to respect the secrecy of any document, drawings
etc. issued to him for the execution of this contract, and restrict access to such documents, drawing etc. to the
minimum and further, the contractor agrees to execute an individual SECRECY agreement from each or any person
employed by contractor having access to such documents, drawings and to any other agency or individual, without
the written approval by Engineer-in-Charge.

43 LIENS:

43.1 If, at any time, there should be evidence or any lien or claim for which the Owner might have become liable and
which is chargeable to the contractor, the Owner shall have the right to retain out of any payment then due or
thereafter to become due an amount sufficient to completely indemnify the owner against such lien or claim and if
such lien or claim be valid the Owner may pay and discharge the same and deduct the amount so paid from any
money which may be or may become due and payable to the Contractor. If any lien or claim remain unsettled after
all payments are made, the contractor shall refund or pay to the Owner all moneys that the latter may be
compelled to pay in discharging such lien or claim including all costs and reasonable expenses.

43.2 Contractor will not disclose details of the work to any person or persons except those engaged in its performance,
and only to the extent required for the particular portion of the work being done. Contractor will not give any items concerning details of the work to the press or a news disseminating agency without prior written approval from Engineer-in-Charge. Contractor shall not take any pictures on site without
written approval of Engineer-in-Charge.

44 OPERATIONS OF CONTRACT:

44.1 Law Governing:
Regardless of the place of contracting, place of performance or otherwise, this Agreement, and all amendments,
modifications, alterations, or supplements, thereto shall be governed by the laws of India and respective state laws
for the nature, validity and interpretation thereof.

44.2 Non-Waiver of Default:
Any failure by the Owner or Contractor at any time, or from time to time, to enforce or require the strict keeping
and performance of any of the terms or conditions of this agreement, or to exercise a right hereunder, shall not
constitute a waiver of such terms, conditions or rights, and shall not affect or impair same, or the right of the
Owner or the Contractor, as the case may be at any time to avail itself of same.
SECTION - V
PERFORMANCE OF WORK

45  EXECUTION OF WORKS:

45.1 All the works shall be executed in strict conformity with the provisions of the contract documents and with such explanatory detailed drawings, specifications, and instructions as may be furnished from time to time to the contractor by the Engineer-in-Charge whether mentioned in the contract or not. The contractor shall be responsible for ensuring that works throughout are executed in the most substantial, proper and workmanlike manner with the quality of material and workmanship in strict accordance with the specifications following all safety requirements of BPCL and as stipulated in work permits as per the directions and to the entire satisfaction of the Engineer-in-Charge.

45.2 Wherever it is mentioned in the specifications that the Contractor shall perform certain work or provide certain facilities/materials, it is understood that the contractor shall do so at his cost unless otherwise specified.

45.3 The materials, design and workmanship shall satisfy the relevant Indian Standards, the Job specification contained herein and codes referred to. Where the job specification stipulate requirements in addition to those contained in the standards codes and specifications, these additional requirements shall also be satisfied.

46  COORDINATION AND INSPECTION OF WORK:

The coordination and inspection of the day-to-day work under the contract shall be the responsibility of the Engineer-in-Charge. The written instructions regarding any particular job will be normally be passed by the Engineer-in-Charge or his authorized representative. A work order book / logbook will be maintained by the Contractor for each job in which the aforesaid written instructions will be entered. These will be signed by the contractor or his authorized representative by way of acknowledgment within 12 hours. The non maintaining of the order book or non signing by the contractor shall not preclude the contractor from complying with the instructions.

47  WORK IN MONSOON AND DEWATERING:

47.1 The completion of the work may entail working in the monsoon also. The contractor must maintain a minimum labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such work in monsoon.

47.2 During monsoon and other period, it shall be the responsibility of the contractor to keep the construction work site free from water at his own cost.

48  WORK ON SUNDAYS AND HOLIDAYS:

For carrying out work on Sundays and Holidays if needed, the contractor will approach the Engineer-in-Charge or his representative at least two days in advance and obtain permission in writing. No special compensation on this account will be payable.

49  GENERAL CONDITIONS FOR CONSTRUCTION AND ERECTION WORK:

49.1 Place of Work:
The work has to be executed at specified premises as per the tender. Contractor should apprise himself of all the conditions prevailing in such location and the restrictions placed on movement of personnel and equipment, types of equipment and tools permitted, working methods allowed etc. in the light of security and safety regulations operative in the area. The safety regulations to be complied with, by the contractor will also be provided along with the tender. No idle time wages or compensation for temporary stoppage of work or restrictions would be paid, and the rate quoted for the various items of work should cover the cost of all such contingencies and eventualities. Substantial structures and utilities exist both above ground and underground, adjacent to the work site. (The construction activity gets restrained by the existence of such structures and utilities). Special care is necessary in transportation, storage, working on equipments and other construction activities to protect the existing features and prevent damage to any facility. Necessary protective structures barricades etc. have to be erected at various places as directed by Engineer-in-Charge. No extra payment of such protective works will be made unless specially provided in the tender.

49.2 The working time or the time of work is 48 hours per week normally. Overtime work is permitted in cases of need and the Owner will not compensate the same. Shift working at 2 or 3 shifts per day may become necessary and the contractor should take this aspect into consideration for formulating his rates for quotation. No extra claims will be entertained by the Owner on this account.

49.3 The contractor must arrange for the placement of workers in such a way that the delayed completing of the work or any part thereof for any reasons whatsoever will not affect their proper employment. The Owner will not entertain any claim for idle time payment whatsoever.

49.4 The contractor shall submit to the Owner reports at regular intervals regarding the state and progress of work. The details and proforma of the report will mutually be agreed after the award of contract.
50  **DRAWINGS TO BE SUPPLIED BY THE OWNER:**

50.1 Where drawings are attached with tender, these shall be for the general guidance of the contractor to enable him to visualize the type of work contemplated and scope of work involved. The contractor will be deemed to have studied the drawings and formed an idea about the work involved.

50.2 Detailed working drawings on the basis of which actual execution of the work is to proceed will be furnished from time to time during the progress of the work. The contractor shall be deemed to have gone through the drawings supplied to him thoroughly and carefully and in conjunction with all other connected drawings and bring to the notice of the Engineer-in-Charge, discrepancies, if any, therein before actually carrying out the work.

50.3 Copies of all detailed working drawings relating to the works shall be kept at the contractor's office of the site and shall be made available to the Engineer-in-Charge at any time during the contract. The drawings and other documents issued by the Owner shall be returned to the Owner on completion of the works. Reference is also invited to clause 42.2 and 42.3 above regarding drawings and other documents.

51  **DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR:**

51.1 Where drawings/data are to be furnished by the contractor, they shall be as enumerated in the special conditions of contract, and shall be furnished within the specified time.

51.2 Where approval of drawings before manufacture / construction / fabrication has been specified, it shall be contractor's responsibility to have these drawings prepared as per the directions of Engineer-in-Charge and got approved before proceeding with manufacture construction / fabrication, as the case may be. Any changes that may have become necessary in these drawings during the execution of the work shall have to be carried out by the contractor to the satisfaction of Engineer-in-Charge at no extra cost. All final drawings shall bear the certification stamps duly signed by both the contractor and the Engineer-in-Charge.

51.3 A period of 3 weeks from the date of receipt shall be required normally for approval of drawings by the Engineer-in-Charge.

52  **SETTING OUT WORKS:**

52.1 The Engineer-in-Charge shall furnish the contractor with only the four corners of the work site and a level bench mark and the contractor shall set out the works and shall provide efficient staff for the purpose and shall be solely responsible for the accuracy of such setting out.

52.2 The contractor shall provide, fix and be responsible for the maintenance of all stacks, templates, level marks, profiles and other similar things and shall take all necessary precaution to prevent their removal or disturbance and shall be responsible for the consequence of such removal or disturbance should the same take place and for their efficient and timely reinstatement. The contractor shall also be responsible for the maintenance of all existing survey marks, boundary marks, distance marks and centre line marks, either existing or supplied and fixed by the contractor. The work shall be set out to the satisfaction of the Engineer-in-Charge. The approval thereof or joining in setting out the work shall not relieve the contractor of any of his responsibilities.

52.3 Before beginning the works, the contractor shall at his own cost, provide all necessary reference and level posts, pegs, bamboos, flags, ranging rods, strings and other materials for proper layout of the work in accordance with the scheme, for bearing marks acceptable to the Engineer-in-Charge. The centre, longitudinal or face lines and cross lines shall be marked by means of small masonry pillars. Each pillar shall have distinct marks at the centre to enable theodolite to be set over it. No work shall be started until all these points are checked and approved by the Engineer-in-Charge in writing but such approval shall not relieve the contractor of any of his responsibilities. The contractor shall also provide all labour, material and other facilities, as necessary, for the proper checking of layout and inspection of the points during construction.

52.4 Pillars bearing geodetic marks located at the site of work under construction should be protected and fenced by the contractor.

52.5 On completion of works, the contractor must submit the geodetic documents according to which the work was carried out.

53  **RESPONSIBILITY FOR LEVEL AND ALIGNMENT:**

The contractor shall be entirely and exclusively responsible for the horizontal and vertical alignment, the levels and correctness of every part of the work and shall rectify effectually any errors or imperfections therein. Such rectifications shall be carried out by the contractor, at his own cost, when instructions are issued to that effect by the Engineer-in-Charge.

54  **MATERIALS TO BE SUPPLIED BY CONTRACTOR:**

54.1 The contractor shall procure and provide the whole of the materials required for construction including tools, tackles, construction plant and equipment for the completion and maintenance of the works except the materials which will be issued by Owner and shall make his own arrangement for procuring such materials and for the transport thereof. The materials procured by the contractor shall be BPCL approved/specified quality.

54.2 All materials procured should meet the specifications given in the tender document. The Engineer-in-Charge may, at his discretion, ask for samples and test certificates for any batch of any material procured. Before procuring, the contractor should get the approval of Engineer-in-Charge for any material to be used for the works.
54.3 Manufacturer’s certificate shall be submitted for all materials supplied by the contractor. If, however, in the opinion of the Engineer-in-Charge any tests are required to be conducted on the materials supplied by the contractor, these will be arranged by the contractor promptly at his own cost.

55 MATERIALS SUPPLIED BY OWNER:

55.1 If the specifications of the work provides for the use of any materials of special description to be supplied from the Owner’s stores, price for such material to be charged therefore as hereinafter mentioned being so far as practicable for the convenience of the contractor but not so as in any way to control the meaning or effect of the contract. The contractor shall be bound to purchase and shall be supplied such materials as are from time to time required to be used by him for the purpose of the contract only. The sums due from the contractor for the value of the actual materials supplied by the Owner will be recovered from the running account bill on the basis of the actual consumption of materials in the work covered and for which the running account bill has been prepared. After the completion of the works, however, the contractor has to account for the full quantity of materials supplied to him as per relevant clauses in this document.

55.2 The value of the materials as may be supplied to the contractor by the Owner will be debited to the contractor’s account at the rates shown in the schedule of chargeable materials and if they are not entered in the schedule, they will be debited at cost price, which for the purpose of the contract shall include the cost of carriage and all other expenses whatsoever such as normal storage supervision charges which shall have been incurred in obtaining the same at the Owner’s stores. All materials so supplied to the contractor shall remain the absolute property of the Owner and shall not be removed on any account from the site of the work, and shall be at all times open for inspection to the Engineer-in-Charge. Any such materials remaining unused at the time of completion or termination of the contract shall be returned to the Owner’s stores or at a place as directed by the Engineer-in-Charge in perfectly good condition, at contractor’s cost.

56 CONDITIONS FOR ISSUE OF MATERIALS:

i) Materials specified to be issued by the Owner will be supplied to the contractor by the Owner from his stores/location. It shall be the responsibility of the contractor to take delivery of the materials and arrange for its loading, transport and unloading at the site of work at his own cost. The materials shall be issued between the working hours and as per the rules of the Owner framed from time to time.

ii) The contractor shall bear all incidental charges for the storage and safe custody of materials at site after these have been issued to him.

iii) Materials specified to be issued by the Owner shall be issued in standard sizes as obtained from the manufacturer.

iv) The contractor shall construct suitable godown at the site of work for storing the materials safe against damage by rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose.

v) It shall be duty of the contractor to inspect the material supplied to him at the time of taking delivery and satisfy himself that they are in good condition. After the materials have been delivered by the Owner, it shall be the responsibility of the contractor to keep them in good condition and if the materials are damaged or lost, at any time, they shall be repaired and/ or replaced by him at his own cost, according to the directions of the Engineer-in-Charge.

vi) The Owner shall not be liable for delay in supply or non-supply of any materials which the Owner has undertaken to supply where such failure or delay is due to natural calamities, act of enemies, transport and procurement difficulties and any circumstances beyond the control of the Owner. In no case, the contractor shall be entitled to claim any compensation or loss suffered by him on this account.

vii) It shall be the responsibility of the contractor to arrange in time all materials required for the works other than those to be supplied by the Owner. If, however, in the opinion of the Engineer-in-Charge the execution of the work is likely to be delayed due to the contractor's inability to make arrangements for supply of materials which normally he has to arrange for, the Engineer-in-Charge shall have the right, at his own discretion, to issue such materials If available with the Owner or procure the materials from the market or elsewhere and the contractor will be bound to take such materials at the rates decided by the Engineer-in-Charge. This, however, does not in any way absolve the contractor from responsibility of making arrangements for the supply of such materials in part or in full, should such a situation occur, nor shall this, constitute a reason for the delay in the execution of the work.

viii) None of the materials supplied to the contractor will be utilized by the contractor for manufacturing item, which can be obtained from standard manufacturer in finished form.

ix) The contractor shall, if desired by the Engineer-in-Charge, be required to execute an indemnity bond for safe custody and accounting of all materials issued by the Owner.

x) The contractor shall furnish to the Engineer-in-Charge sufficiently in advance a statement showing his requirements of the quantities of the materials to be supplied by the Owner and the time when the same will be required by him for the works, so as to enable the Engineer-in-Charge to make necessary arrangement for procurement and supply of the material.

xi) A daily account of the materials issued by the Owner shall be maintained by the contractor indicating the daily receipt, consumption and balance in hand. This account shall be maintained in a manner prescribed by the Engineer-in-Charge along with all connected papers viz. requisition, issues etc. and shall be always available for inspection in the contractor’s office at site.
xii) The contractor should see that only the required quantities of materials are got issued. The contractor shall not be entitled to cartage and incidental charges for returning the surplus materials, if any, to the stores/location where from they were issued or to the place as directed by the Engineer-in-Charge.

xiii) Materials/Equipment supplied by Owner shall not be utilized for any other purpose(s) than issued for.

57 MATERIALS PROCURED WITH ASSISTANCE OF OWNER:

Notwithstanding anything contained to the contrary in any or all the clause of this document where any materials for the execution of the contract are procured with the assistance of Owner either by issue from Owner’s stock or purchase made under orders or permits or licences issued by Government, the contractor shall hold the said materials as trustee for the Owner and use such materials economically and solely for the purpose of the contract and not dispose them off without the permission of the owner and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason, whatsoever on his being paid or credited such prices as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however, shall not exceed the amount charged to him excluding the storage charges if any. The decision of the Engineer-in-Charge shall be final and conclusive in such matters. In the event of breach of the aforesaid condition, the contractor shall in terms of the licenses or permits, and/or for criminal breach of trust, be liable to compensate the Owner a double rate or high rate, in the event of those materials at that time having higher rate or not being available in the market, then any other rate to be determined by the Engineer-in-Charge and his decision shall be final and conclusive.

58 MATERIALS OBTAINED FROM DISMANTLING:

If the contractor in the course of execution of the work is called upon to dismantle any part for reasons other than those stipulated in clauses 64 & 68 hereunder, the materials obtained in the work of dismantling etc. will be considered as the Owner’s property and will be disposed off to the best advantage of the Owner.

59 ARTICLES OF VALUE FOUND:

All gold, silver and other materials, of any description and all precious stones, coins, treasure reliefs, antiquities and other similar things which shall be found in, under or upon the site, shall be property of the Owner and the contractor shall duly preserve the same to the satisfaction of the Engineer-in-Charge and shall from time to time deliver the same to such person or person indicated by the Owner.

60 DISCREPANCIES BETWEEN INSTRUCTIONS:

Should any discrepancy occur between the various instructions furnished to the contractor, his agents or staff or any doubt, arise as to the meaning of any such instructions or should there be any misunderstanding between the contractor’s staff and the Engineer-in-Charge’s staff, the contractor shall refer the matter immediately in writing to the Engineer-in-Charge whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, or doubts, or misunderstanding shall in any event be admissible.

61 ALTERATIONS IN SPECIFICATIONS AND DESIGNS AND EXTRA WORK:

A) The Engineer-in-Charge shall have power to make any alterations in, omissions from, additions to or substitutions for, the schedule of rates, the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out such altered / extra / new items of work in accordance with any instructions which may be given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall not invalidate the contract and any altered additional or substituted work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respect on which he agree to do the main work. The time for completion of work may be extended for the part of the particular job at the discretions of the Engineer-in-Charge, for only such alteration, additions or substitutions of the work, as he may consider as just and reasonable. The rates for such additional, altered or substituted work under this clause shall be worked out in accordance with the following provisions:

a) If the rates for the additional, altered or substituted work are specified in the contract for the work, the contractor is bound to carry out the additional, altered or substituted work at the same rates as are specified in the contract.

b) If the rates for the additional, altered or substituted work are not specifically provided in the contract for the work, the rates will be derived from the rates for similar class of works as specified in the contract for the work. The opinion of the Engineer-in-Charge as to whether the rates can be reasonably so derived from items in the contracts will be final and binding on the contractor.

c) If the rates for the altered, additional or substituted work cannot be determined in the manner specified in sub-clause (a) and (b) above, then the contractor shall inform the Engineer-in-Charge of the rate which is his intention to charge for such class of work supported by analysis of the rate or rates claimed, and the Engineer-in-Charge shall determine the rates on the basis of the prevailing market rates of materials, labour
cost at schedule of labour plus 10% to cover contractor’s supervision, overheads and profit and pay the contractor accordingly. The opinion of the Engineer-in-Charge as to the current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the contractor.

d) Provisions, contained in sub-clause (a) to (c) above shall not, however, apply:
Where the value of alterations / additions / deletions or substitutions exceeds beyond plus or minus 25% of the estimated contract value (i.e. quoted item rates of contractor shall hold good for variations etc. within plus or minus 25% of estimated contract value)

B) In the event and as a result of such alternatives / additions / substitutions / deletion, the scope of contract work exceed the value stipulated in the contract by more than the limits given in clause (d) above, the Contractor shall claim revision of the rates supported by the proper analysis in respect of such items for quantities in excess of the above limits, notwithstanding the fact that the rates for such items exist in the tender for the main work or can be derived in accordance with the provision of sub-clause (b) of Clause 61 A, and the Engineer-in-Charge may revise their rates having regard to the prevailing market rates, and the contractor shall be paid in accordance with the rates so fixed. But, under no circumstances the contractor shall suspend / stop / slowdown the work on the plea of non-settlement of rates of items falling under this clause.

62. ACTION WHERE NO SPECIFICATIONS ISSUED:

In case of any class of work for which there is no such specification given by the Owner in the tender documents, such work shall be carried out in accordance with Indian Standard Specifications and if the Indian Standard Specifications do not cover the same the work should be carried out as per standard Engineering Practice subject to the approval of the Engineer-in-Charge.

63. ABNORMAL RATES:
The contractor is expected to quote rate for each item after analysis of cost involved for the completion of item/work, considering all specifications and conditions of contract. This will avoid loss of profit or gain, in case of curtailment or change of specification for any item. In case it is noticed that the rates for any item, quoted by the tenderer are unusually high or unusually low (i.e. in case of variation plus or minus 25% between tendered rates and estimates), it will be sufficient cause for the rejection of the tender unless the Owner is convinced about the reasonableness of the rates on scrutiny of the analysis for such rate to be furnished by the tenderer on demand.

64. INSPECTION OF WORK:

64.1 The Engineer-in-Charge will have full power and authority to inspect the works at any time wherever in progress either on the Site or at the contractor’s premises / workshop where situated premises /workshops of any person, firm or corporation where work in connect with the contract may be in hand or where materials are being or are to be supplied, and the contractor shall afford or procure for the Engineer-in-Charge every facility and assistance to carry out such Inspection. The contractor shall at all time during the usual working hours and at all other time for which reasonable notice of the intention of the Engineer in-Charge or his representative to visit the works have been given to the contractor, either himself be present to receive order and instructions or post a responsible agent duly accredited in writing for the purpose. Orders given to the contractor’s agent shall be considered to have the same force as if they had been given to the contractor himself. The contractor shall give not less than seven days, notice in writing to the Engineer-in-Charge before covering up or placing any work beyond reach of inspection and measurement any work in order that the same may be inspected and measured. In the event of breach of above the same shall be uncovered at contractor’s expense carrying out such measurement or inspection.

64.2 No materials shall be dispatched by the contractor before obtaining the approval of Engineer-in-Charge in writing.

The contractor is to provide at all times during the progress of the work and the maintenance period, proper means of access with ladders, gangways, etc. and the necessary attendance to move and adopt as directed for inspection or measurement of the works by the Engineer-in-Charge.

65. ASSISTANCE TO THE ENGINEERS:
The contractor shall make available to the Engineer-in-Charge, free of cost necessary instruments and assistance in checking of setting out of works and taking measurement of work.

66. TESTS FOR QUALITY OF WORKS:

66.1 All workmanship shall be of the respective kinds described in the contract documents and in accordance with the instructions of the Engineer-in-Charge and shall be subjected from time to time to such test at contractor’s cost as the Engineer-in-Charge may direct at place of manufacture or fabrication or on the site or at all or any such places. The contractor shall provide assistance, instruments, labour and materials as are normally required for examining, measuring and testing any workmanship as may be selected and required by the Engineer-in-Charge.

66.2 All the tests necessary in connection with the execution of the work as decided by Engineer-in-Charge shall be carried out at the field testing laboratory of the Owner by paying the charges as decided by the Owner from time to time. In case of non-availability of test facility with the Owner, the required test shall be carried out at the cost of contractor at government or any other testing laboratory as directed by Engineer-in-Charge.
66.3 If any tests are required to be carried out in connection with the work or materials of which workmanship is not supplied by the contractor, such tests shall be carried out by the contractor as per the instructions of Engineer-in-Charge and cost of such tests shall be reimbursed by the Owner.

67. **SAMPLES:**

The contractor shall furnish to the Engineer-in-Charge for approval when requested or if required by the specifications, adequate samples of all materials and finishes to be used in the work. Such samples shall be submitted before the work is commenced and in ample time to permit tests and examinations thereof. All materials furnished and finishing applied in actual work shall be fully identical to the approval samples.

68. **ACTION AND COMPENSATION IN CASE OF BAD WORK:**

If it shall appear to the Engineer-in-Charge that any work has been executed with unsound, imperfect or unskilled workmanship or with materials of any inferior description, or that any materials or articles provided by the contractor for the execution of the work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the contract, the contractor shall on demand in writing from the Engineer-in-Charge or his authorised representative, specifying the work, materials or articles complained of, notwithstanding that the same have been inadvertently passed, certified and paid for, shall rectify or remove and reconstruct the works specified and provide other proper and suitable materials or articles at his own charge and cost, and in the event of failure to do so within a period to be specified by the Engineer-in-Charge in his demand aforesaid, the contractor shall be liable to pay compensation at the rate of one percentage of the estimated cost of the whole work, for every week limited to a maximum of 10 per cent of the estimated cost of the whole work, while his failure to do so shall continue and in the case of any such failure the Engineer-in-Charge may on expiry of notice period rectify or remove and re-execute the work or remove and replace with others, the materials or articles complained of as the case may be at the risk and expenses of the contractors in all respects. The decision of the Engineer-in-Charge as to any question arising under this clause shall be final and conclusive.

69. **SUSPENSION OF WORKS:**

The contractor shall, if ordered in writing by the Engineer-in-Charge or his representative, temporarily suspend the works or any part thereof for such period and such time as so ordered and shall not, after receiving such written order, proceed with the work therein ordered to be suspended, until he shall have received a written order to proceed therewith. The contractor shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of the works aforesaid. An extension of time for completion, corresponding with the delay caused by any such suspension of the works as aforesaid will be granted to the contractor, should he apply for the same, provided that suspension was not consequent to any default or failure on the part of the contractor.

70. **OWNER MAY DO PART OF WORK:**

Upon failure of the contractor to comply with any instructions given in accordance with the provisions of the contract, the owner has the alternative right, instead of assuming charge for entire work to place additional labour force, tools, equipments and materials on such parts of the work, as the owner may designate or also engage another contractor to carry out the work. In such cases, the owner shall deduct from the amount which otherwise might become due to the contractor, the cost of such work and materials with ten percent added to cover all departmental charges and should the total amount thereof exceed the amount due to the contractor, the contractor shall pay the difference to the owner.

71. **POSSESSION PRIOR TO COMPLETION:**

The Engineer-in-Charge shall have the right to take possession of or use any completed or partially completed work or part of the work. Such possessions or use shall not be deemed to be an acceptance of any work completed in accordance with the contract agreement. If such prior possession or use by the Engineer-in-Charge delays the progress of work, suitable adjustment in the time of completion will made and contract agreement shall be deemed to be modified accordingly.

72. **PERIOD OF LIABILITY FROM THE DATE OF COMPLETION OF WORK:**

72.1 The contractor shall guarantee the installation/site work for a period of - 12 (twelve) Months from the date of completion of work, unless otherwise specified. Any damage that may lie undiscovered at the time of issue of completion certificate, connected in any way with the equipment or materials supplied by him or in the workmanship shall be rectified or replaced by the contractor at his own expense as deemed necessary by the Engineer-in-Charge or in default, the Engineer-in-Charge may cause the same made good by other workmen and deduct expenses (for which the certificate of Engineer-in-Charge shall be final) from any sums that may be then or at any time thereafter, become due to the contractor or from his security deposit.
72.2 If the contractor feels that any variation in work or in quality of materials or proportions would be beneficial or necessary to fulfill the guarantee called for, he shall bring this to the notice of the Engineer-in-Charge in writing. The work will not be considered as complete and taken over by the Owner until all the temporary works etc., constructed by the contractor is removed and work site cleaned to the satisfaction of Engineer-in-Charge.

72.3 Care of Works:
From the commencement to completion of works, the contractor shall take full responsibility for the care of all works including all temporary works, and in case any damage, loss or injury happens to the works or to any part thereof or to any temporary work, from any cause whatsoever, he shall at own cost repair and make good the same, so that at completion, the work shall be in good order and in conformity in every respect with the requirements of the contract and the Engineer-in-Charge's instructions.

72.4 Effects prior to taking over:
If at any time, before the work is taken over, the Engineer-in-Charge shall

a) Decide that any work done or materials used by the contractor or any sub-contractor is defective or not in accordance with the contract or that the works or any portion thereof are defective or do not fulfill the requirements of contract (all such matters being herein after called 'Defects' in this clause) and

b) As soon as reasonably practicable, notice given to the contractor in writing of the said decisions specifying particulars of the defects alleged to exist or to have occurred, then the contractor shall at his own expenses and with all speed make good the defects so specified.

In the case contractor shall fail to do so, the Owner may take, at the cost of the contractor, such steps as may in all circumstances, be reasonable to make good such defects. The expenditure, so incurred by the Owner shall be recovered from the amount due to the contractor. The decision of the Engineer-in-Charge with regard to the amount be recovered from the contractor will be final and binding on the contractor. As soon as the works have been completed in accordance with the contract (except in minor respects that do not affect their use for the purpose for which they are intended and except for maintenance thereof provided in clause 72.1) and have passed the tests on completion, the Engineer-in-Charge shall issue a certificate (hereinafter called completion certificate) in which he shall certify the date on which the work have been so completed and have passed the said tests and the Owner shall be deemed to have taken over the works or any portion thereof on the date so certified. If the works have been divided into various groups in the contract, the Owner shall be entitled to take over any group or groups before the other or others and thereupon the Engineer-in-Charge shall issue a completion certificate which will however, be for such group or groups as taken over only.

72.5 Defects after taking over:
In order that the contractor could obtain a completion certificate, he shall make good with all possible speed, any defect arising from the defective materials supplied by the Contractor or workmanship or any act of omission of the contract that may have been noticed or developed after the works or group of the works has been taken over. The period allowed for carrying out such work will be normally one month. If any defect be not remedied within a reasonable time, the Owner may proceed to do the work at the contractor's risk and expense and recover such expenses and other charges from amount payable to the contractor including security deposit and the contractor, on demand of owner, shall pay the balance amount, if any, to the owner. If by reason of any default on the part of the contractor a completion certificate has not been issued in respect of every portion of the work within one month after the date fixed by the contract for the completion of the works, the Owner shall be at his liberty to use the works or any portion thereof in respect of which a completion certificate has been issued provided that the works or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completing these works for the issue of completion certificate.

72.6 The Security Deposit/retention money deducted / furnished as per clause 18 of GCC shall be retained for the period of liability as given in clause 72.1 above. This Retention amount or Bank Guarantee furnished against Security Deposit/retention money shall be released only on expiry of the period of liability and also based on the certification of the Engineer-in-charge that no defect/damage has been reported / observed during the stipulated period of liability for the contract.

72.7 Performance of contractor shall be evaluated on each job by Engineer-in-Charge and recorded. The format given below is only indicative of major parameters on which performance will be evaluated. However, the detailed contractor performance monitoring format prevailing at the time of evaluation of contractor performance will be used. Review of performance will be carried out at appropriate intervals by BPCL.
# PERFORMANCE OF CONTRACTOR

**Date**: ...........................

**JOB**: ...................................................................................................................................................................

**CONTRACTOR**: ..................................................................................................................................................

**CONTRACT NO. & DATE**: ....................................................................................................................................

**DATE OF START**: .................................................... **DATE OF COMPLETION**: ...........................................

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**ENGINEER-IN-CHARGE**

**NAME**

**DESIGNATION**
73. SCHEDULE OF RATES AND PAYMENTS:

i) Contractor’s Remuneration
The price to be paid by the Owner to contractor for the whole of the work to be done and the performance of all the obligations undertaken by the contractor under the contract documents shall be ascertained by the application of the respective item rates (the inclusive nature of which is more particularly defined by way of application but not of limitation, with the succeeding sub-clause of this clause) and payment to be made accordingly for the work actually executed and approved by the Engineer-in-Charge. The sum so ascertained shall (excepting only as and to the extent expressly provided herein) constitute the sole and inclusive remuneration of the contractor under the contract and no further payment whatsoever shall be or become due or payable to the contractor under the contract.

ii) Schedule of rates to be inclusive:
The prices/rates quoted by the contractor shall remain firm till the issue of final completion certificate and shall not be subject to escalation. Schedule of rates shall be deemed to include and cover all costs, expense and liabilities of every description and all risk of every kind to be taken in executing, completing and handing over the work to the Owner by the Contractor. The Contractor shall be deemed to have known the nature, scope, magnitude and the extent of the works and materials required, though the contract document may not fully and precisely furnish them. He shall make such provision in the item rates as he may consider necessary to cover the cost of such items of work and materials as may be reasonable and necessary to complete the works. The opinion of the Engineer-in-Charge as to the items of work which are necessary and reasonable for completion of work shall be final and binding on the contractor, although the same may not be shown on or described specially in contract documents. Generality of this present provision shall not be deemed to cut down or limit in any way because in certain cases it may and in other cases it may not be expressly stated that the contractor shall do or perform a work or supply articles or perform services at his own cost or without addition of payment or without extra charges or words to the same effect or that it may be stated or not stated that the same are included in and covered by the schedule of rates.

iii) Schedule of Rates to Cover Constructional Equipments, Materials, Labour etc.
Without in any way limiting the provisions of the preceding sub-clause, the schedule of rates shall be deemed to include and cover the cost of all constructional equipment, temporary work (except as provided for herein), pumps, materials, labour, the insurance, fuel, stores and appliances to be supplied by the contractor and other matters in connection with each item in the schedule of rates and the execution of the works or any portion thereof, finished, complete in every respect and maintained as shown or described in the contract documents or may be ordered in writing during the continuance of this contract.

iv) Schedule of Rates to cover Royalties, Rents and Claims:
The Schedule of Rates shall be deemed to include and cover the cost of all royalties and fees for the articles and processes, protected by letters, or otherwise incorporated in or used in connection with the works, also all royalties, rents and other payments in connection with obtaining materials of whatsoever kind for the works and shall include an indemnity to the Owner which the contractor hereby gives against all actions, proceedings, claims damages, costs and expenses arising from the incorporation in or use on the works of a such articles, processes or materials, Octroi or other municipal or local Board charges levied on materials, equipment or machineries to be brought to site for use on work shall be borne by the contractor.

v) Schedule of Rates to Cover Taxes and Duties:
No claim or exemption or reduction of customs duties, excise duties, sales tax, quarry or any port dues, transport charges, stamp duties or Central or States Government or Local Body or Municipal Taxes or duties, taxes or charges (from or of any other body), whatsoever, will be granted or obtained, all of which expenses shall be deemed to be included in and covered by the Schedule of Rates. Contractor shall also obtain and pay for all permits, or other privileges necessary to complete work.

vi) Schedule of Rates to cover Risk of Delay:
The schedule of Rates shall be deemed to include and cover the risk of all possibilities of delay and interference with the contractors conduct of work which occur from any cause including orders of owner in the exercises of his powers and on account of extension of time granted due to various reasons and for all other possible or probable cause of delay.

vii) Schedule of Rates cannot be altered:
For work under unit rate basis, no alteration will be allowed in the schedule of Rates by reason of work or any part of them being modified, altered, extended, diminished or omitted. The schedule of Rates are fully Inclusive rates which have been fixed by the contractor and agreed to the Owner and cannot be altered.
For lumpsum contract, the payment will be made according to the work actually carried out for which purpose an item wise or workwise, Schedule of rates shall be furnished, suitable for evaluating the value of work done and preparing running account bills.

74. **PROCEDURE FOR MEASUREMENT / BILLING OF WORK IN PROGRESS:**

i) **Measurements:**
All measurements shall be in metric system. All the works in progress will be jointly measured by the representative of the Engineer-in-Charge and the Contractor's authorised agent progressively. Such measurement will be got recorded in the measurement book by the Engineer-in-Charge or his authorised representative and signed in token of acceptance by the contractor or his authorised representative. For the purpose of taking joint measurement the contractor’s representative shall be bound to be present whenever required by the Engineer-in-Charge. If, however, he absents for any reason whatsoever the measurement will be taken by the Engineer-in-Charge or his representative and this will be deemed to be correct and binding on the contractor.

ii) **Billing:**
The contractor will submit a bill in approved proforma in duplicate (triplicate in the case of jobs executed through PMC) to the Engineer-in-Charge of the work giving abstract and detailed measurements for the various items executed during a month, before the expiry of the 1st week of the succeeding month. The Engineer-in-Charge shall take or cause to be taken the requisite measurements for the purpose of having the same verified and the claim, as far as admissible, adjusted, if possible, before the expiry of 10 days from presentation of the bill.

iii) **Dispute in Mode of Measurements:**
In case of any dispute as to the mode of measurement not covered by the contract to be adopted for any item of work, mode of measurement as per latest Indian Standard Specifications shall be followed.

75. **LUMPSONS IN TENDER:**
For the items in tender where it includes lumpsum in respect of parts of work, the contractor shall be entitled to payment in respect of the items at the same rates as are payable under this contract for such items, or if part of the work in question is not In the opinion of the Engineer-in-Charge capable of measurement of determination, the owner may at his discretion pay the lumpsum amount entered in the tender or a percentage thereof and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regards to any sum or sums payable to him under the provisions of the clause.

76. **RUNNING ACCOUNT PAYMENTS TO BE REGARDED AS ADVANCES:**
All running account payments shall be regarded as payment by way of advance against the final payment only and not as payments for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect, or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in this respect, or of the accruing of any claim by the contractor, nor shall it conclude, determine or affect in any way the powers of the Owner under these conditions or any of them as to the final settlement and the adjustments of the accounts or otherwise, or in any other way vary or affect the contract.

The final bill shall be submitted by the contractor within one month of the date of physical completion of the work, and settled immediately but not later than 60 days. Otherwise the Engineer-in-Charge's certificate of the measurement and of total amount payable for the work accordingly shall be final and binding on all parties. The final bill shall be presented by the contractor along with 'No claim certificate' in a format acceptable to the owner or such other documents as directed by the owner.

77. **EXTRA WORK:**
Should the contractor consider that he is entitled to any extra payment for extra job carried out whatsoever in respect of the works, he shall forthwith give notice in writing to the Engineer-in-Charge that he claims extra payment for the extra work. Such notice shall be given to the Engineer-in-Charge within one week from the ordering of any extra work or happening of any event, upon which the contractor bases such claims, and such notice shall contain full particulars of the nature of such claim with full details and amount claimed. Failure on part of the contractor to put forward any claim with the necessary particulars as above within the time above specified shall be an absolute waiver thereof. No omission by the owner to reject any such claim and no delay in dealing therewith shall be waiver by the owner of any rights in respect thereof.

78. **PAYMENT OF CONTRACTOR’S BILL:**
Generally no payment shall be made for works estimated to cost less than Rs. 50,000/- till the whole of the work shall have been completed. But in case of works estimated to cost more than Rs. 50,000/-, the contractor on submitting the bill thereof shall be entitled to receive a monthly payment proportionate to the part thereof
approved and passed by the Engineer-in-Charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor. This payment will be made after making necessary deductions as stipulated elsewhere in the contract document for materials, security deposit or any moneys due to the Owner etc.

79. **MODE OF PAYMENT:**

Payment will be made to the contractor normally through NEFT or RTGS mode.

80. **COMPLETION CERTIFICATE:**

80.1 **Application for Completion Certificate:**
When the contractor fulfills his obligation under clause 72.4, he shall be eligible to apply for completion certificate. The contractor may apply for separate completion certificate in respect of each such portion of the work by submitting the completion documents along with such application for completion certificate. The Engineer-in-Charge shall normally issue to the contractor the completion certificate within one month after receiving an application from the contractor after verifying from the completion documents and satisfying himself that the work has been completed in accordance with and as set out in the construction and erection drawings and the contract documents.

The contractor, after obtaining the completion certificate is eligible to present the final bill for the work executed by him under the terms of contract.

80.2 **Completion Certificate:**
The contractor shall be furnished with a certificate by the Engineer-in-Charge of such completion, but no certificate shall be given nor shall the work be deemed to have been executed until all scaffolding surplus materials and rubbish is cleared off the site completely or until the work shall have been measured by the Engineer-in-Charge whose measurement shall be binding and conclusive. The work will not be considered as complete and taken over by the Owner, until all the temporary works, labour and staff colonies etc. constructed are removed and the work site cleaned of all debris etc., as described in clause 80.3 below and to the satisfaction of the Engineer-in-Charge.

If the contractor shall fail to comply with the requirements of this clause on or before the date fixed for the completion of the work, the Engineer-in-Charge may at the expenses of the contractor remove such scaffolding, surplus materials and rubbish and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realised by the sale thereof.

80.3 **Clearing the site:**
Cart away all debris generated from the work and dispose it off without giving rise to any complaints from local, municipal or government authorities. Metal scraps or any other scrap including wooden packing materials shall be disposed as instructed by the Engineer-in-Charge or as follows:

a) All unused scrap steel bar/structural steel sections/pipe materials etc., (Free issue by owner) shall be the property of the owner and the same shall be returned by the contractor category-wise at their own cost to Owner’s store. The weighment slip issued by the Warehouse (in original) is required to be attached along with the final bill/material reconciliation statement. In case, the material is supplied by the contractor, as per their scope of work, the scrap material generated out of the same should be taken out at their own cost before the settlement of the final bill.

b) Insulation material (either issued by owner to the contractor or supplied by contractor) shall be kept in the area allocated by owner. During the insulation activities, the contractor should keep the work area clean on day-to-day basis. On completion of insulation job, all debris/packing should be taken out to the designated location or as directed by the Engineer in charge for disposal at their own cost before the settlement of the final bill.

80.4 The financial implication of above, if any, should be taken care of in the quoted rates; and no separate claim shall be entertained on this account. The final bill of the contractor shall be linked with the area cleaning in all respects, including removal of shuttering material, disposal of debris/scrap etc. to the entire satisfaction of Engineer-in-Charge.

81. **FINAL DECISION AND FINAL CERTIFICATE:**

Upon Expiry of the period of liability and subject to the Engineer-in-Charge being satisfied that the works have been duly maintained by the contractor during monsoon or such period as herein before provided in clause 72 and that the contractor has in all respect duly made up any subsidence and performed all his obligations under the contract, the Engineer-in-Charge shall (without prejudice to the rights of the Owner to retain the provisions of relevant clause hereof) give a certificate herein referred to as the final certificate to that effect. The contractor shall not be considered to have fulfilled the whole of his obligations under the contract until Final Certificate have been given by
the Engineer-in-Charge notwithstanding any previous entry upon the work and taking possession, working or using of the same or any part thereof by the owner.

82. **CERTIFICATE FOR PAYMENTS AND EVIDENCE OF COMPLETION:**

Except the final certificate, no other certificate or payments against a certificate or on general account shall be taken to be an admission by the Owner of the due performance of the contract or any part thereof or occupancy or validity of any claim by the contractor.
SECTION VII
TAXES/DUTIES/INSURANCE

83. TAXES, DUTIES, OCTROI ETC.: 

The contractor agrees to and does hereby accept full and exclusive liability for the payment of any and all taxes, duties, octroi etc. now in force or hereafter imposed, increased or modified, from time to time in respect of work and materials and all contributions and taxes for unemployment compensation, insurance and old age pensions or annuities now or hereafter imposed by any Central or State Government authorities which are imposed with respect to or covered by the wages, salaries, or other compensations paid to the persons employed by the contractor and the contractor shall be responsible for the compliance with all obligations and restrictions imposed by the Labour Law or any other law affecting employer - employee relationship and the contractor further agrees to comply and secure the compliance by all sub-contractors, with all applicable Central, State, Municipal and local laws and regulations and requirements of any Central, State or Local Government agency or authority. Contractor further agrees to defend, indemnify and hold harmless from any liability or penalty which may be imposed by the Central, State or Local Authority by reason of any violation by contractor or sub-contractor of such laws, regulations or requirements and also from all claims, suits or proceeding that may be brought against the Owner arising under, growing out of, or by reason of the work provided for by this contract by third parties, or by Central or State Government authority or any administrative sub-division thereof.

84. INSURANCE:

Contractor shall at his own expenses carry and maintain insurance with reputable insurance companies to the satisfaction of the Owner as follows:

i) Employees State Insurance Act:

The Contractor agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employees State Insurance Act, 1948, and the contractor further agrees to defend, indemnify and hold Owner harmless from any liability or penalty which may be imposed by the Central, State or Local Authority by reason of any asserted violation by contractor or sub-contractor, of the Employee State Act, 1948 and also from all claims suits or proceedings that may be brought against the Owner arising under, growing out of or by reason of the work provided for by this contract whether brought by employees of the contractor, by third parties or by Central or State Government authority or any political sub-division thereof.

The contractor agrees to filing, with the Employees State Insurance Corporation, the Declaration Forms and all forms which may be required in respect of the contractor’s or sub-contractor’s employees whose aggregate remuneration as fixed by the concerned authorities and who are employed in the work provided for or those covered by ESI Act under any amendment to the Act from time to time. The contractor shall deduct and secure the agreement of the sub-contractor to deduct the employee’s contribution as per the first schedule of the Employee State Insurance Act from wages and affix the Employee’s contribution Cards at Wages payment intervals. The contractor shall remit and secure the agreement of the sub-contractor to remit to the authorized bank, Employee’s State Insurance Corporation Account, the Employee’s contribution as required by the Act. The contractor agrees to maintain all Cards and records as required under the Act in respect of employees and the payments and the contractor shall secure the agreement of the subcontractor to maintain such records. Any expenses incurred for the contribution, making contribution or maintaining records shall be to the contractor’s or sub-contractor’s account.

The Owner shall retain such sum as may necessary, from the total contract value until contractor shall furnish satisfactory proof that all contributions as required by the Employees State Insurance Act, 1948, have been paid.

ii) Workman’s Compensation and Employee’s Liability Insurance:

Insurance shall be effected for all the Contractor’s employees engaged in the performs of this contract, if any of the work is sublet, the contractor shall require the sub-contractor to provide workman’s compensation and employer’s liability Insurance for the latter’s employees if such employees are not covered under the contractors insurance.

iii) Any other Insurance Required Under Law or Regulations or by Owner:

Owner shall cover Project Material and Equipments under and over all Marine-cum-Erection Insurance Policy. Contractor shall carry and maintain any and all other insurance which be required under any law or regulation from time to time. He shall also carry and main any other insurance which may be required by the Owner.

iv) Automobile Liability Insurance:

Contractor shall take out an Automobile Liability Insurance to cover all risks to Owner for each of his vehicles plying on works of this contract and these insurance shall be valid for the total contract period. No extra payments will be made for this insurance. Owner shall not be liable for any damage or loss not made good by the insurance company, should such damage or loss result from unauthorised use of the vehicle.
85. **DAMAGE TO PROPERTY:**

i) Contractor shall be responsible for making good, to the satisfaction of the Owner any loss of and any damage to all structures and properties belonging to the Owner or being executed or procured or being procured by the Owner or of other agencies within the premise all the work of the Owner, if such loss or damage is due to fault and/or the negligence willful acts or omission of contractor, his employees, agents, representative or sub-contractor.

ii) The contractor shall indemnify and keep the Owner harmless of all claims for damage to property other than Owner's property arising under or by reason of this agreement if such claims results from the fault and/or negligence or willful acts or omission of contractor, his employees, agents, representatives or sub-contractors.
SECTION VIII
LABOUR LAWS AND OTHER REGULATIONS

86. LABOUR LAWS:
   i) No labour below the age of eighteen years shall be employed on the work.
   ii) The contractor shall not pay less than what is provided under the Minimum Wages Act for the applicable trade or category of workman to the worker engaged by him on the work and also ensure that any sub-contractors engaged by him also pay not below the applicable minimum wages under the Act and hold the company, indemnified in respect of any claims that may arise in respect or non-compliance with this requirements.
   iii) The contractor shall observe all the formalities required under the provisions of the contract labour (Regulation and abolition) Act 1970 and the rules made thereunder and as may be amended from time to time. He shall pay the required deposit under the Act Appropriate to the number of workmen to be employed by him or through sub-contractor and get him self registered under the Act. He shall produce the certificate of registration granted by the Govt. authority under the Act to the company before commencement of work. The company recognises only the contractor and not his sub-contractors under the provisions of the Act. The contractor will have to submit daily a list of his employees, who will be entering the Company’s premises for the work awarded. He will also keep his wage register available at all times as close to the work site as possible and produce the same for inspection whenever required by designated Company officials. If the company so desires, a deposit may be taken from the Contractor to be refunded only after the Company is satisfied that all the workmen employed by the contractor have been fully paid for the period of work in Company’s premises at least at rates equal to or better than wages provided for under the Minimum Wages Act.
   iv) The Contractor will comply with the provisions of the employee’s Provident Fund Act and the Family Pension Fund Act as may be applicable and as amended from time to time. Contractor shall obtain their own provident fund account number. Offer of the contractor who does not have provident fund account will be liable for rejection.
   v) The Contractor will comply with the provisions of the Payment of Gratuity Act 1972 as may be applicable and as amended from time to time.

87. IMPLEMENTATION OF APPRENTICES ACT 1961:
   The Contractor shall comply with provisions of the Apprentices Act 1961 and the Rules/orders issued thereunder from time to time. If he fails to do so, his failure will be breach of the contract and the Engineer-in-Charge may, at his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provision of the act.

88. CONTRACTOR TO INDEMNIFY THE OWNER:
   i) The contractor shall indemnity the owner and every member, officer and employee of the Owner, also the Engineer-in-Charge and his staff against all actions, proceedings, claims, demands, costs, and expenses whatsoever arising out of or in connection with the matters referred to in clause 84 and all actions/proceedings, claims, demands, costs and expenses which may be made against the Owner for or in respect of or arising out of any failure by the contractor in the performance of his obligations under the contract documents. The Owner shall not be liable for or in respect of any demand or compensation payable by law in respect of or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or his sub-contractor and contractor shall indemnify and keep indemnified the Owner against all such damages and compensations and against all claims, damage, proceedings, costs, charges and expenses whatsoever, thereof or in relation thereto.
   ii) Payment of Claims and Damages:
      Should the Owner have to pay any money in respect of such claims or demands as aforesaid the amount so paid and the costs incurred by the Owner shall be charged to and paid the Contractor and the contractor shall not be at liberty to dispute or question the rig of the Owner to make such payments notwithstanding the same may have been made without his consent or authority or in law or otherwise to the country.
      In every case to which by virtue of the provisions of Section 12, sub-section (1) of workmen's compensation Act 1923 or other applicable provisions of workmen's Compensation Act any other Act, the Owner is obliged to pay compensation to a workmen employed by contractor in execution of the works, the Owner will recover from the contractor the amount of compensation so paid and without prejudice to the rights of Owner under Section 12 sub-section (2) of the said Act. Owner shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due to the contractor whether under the contract or otherwise. The Owner shall not be bound to contest any clime made under Section 12, sub-section (1) of the said Act except on the written request of contractor and upon his giving to the Owner full security for all costs for which the Owner might become liable on consequence of contesting such claims.
iii) Employment Liability:
   a) The contractor shall be solely and exclusively responsible for engaging or employing persons for the execution of work. All employees engaged by the contractor shall be on his/their payroll and paid by him/them. All disputes or differences between the contractor and his/their employees shall be settled by him/them. Owner has absolutely no liability whatsoever concerning the employees of the contractor. The contractor shall indemnify owner against all loss or damage or liability arising out of or in the course of his/her employees. The contractor shall make regular and full payment of wages without giving any complaint by any employee of the contractor or his sub-contractor regarding non-payment of wages/salaries or other dues. Owner reserves the right to make such payments directly, to such employee or sub-contractor of the contractor and recover the amount in full from the bills of Contractor, and the contractor shall not claim any compensation or reimbursement thereof. The Contractor shall comply with the Minimum Wages Act applicable to the area with regard to payment of wages of his employees and also of employees of his sub-contractor.

   b) The Contractor shall advise in writing to all of his employees and the employees of his sub-contractor as follows:
      It is fully understood that your appointment and/or deployment is only in connection with the work/job and it does not give you any right of claim for employment by owner.

89.A HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS:

In respect of all labour directly employed in the works for performance of the contractor's part this agreement, the contractor shall comply with or cause to be complied with all the rules and regulations of the local sanitary and other authorities or as framed by the Owner from time to time for the protection of health and sanitary arrangements for all workers.

89.B MEDICAL FITNESS CERTIFICATION:

Contractor shall follow guidelines for medical fitness certification of workers employed for working at height more than 30 metres using temporary structures.

90. SAFETY REGULATIONS:

i) In respect of all labour, directly or indirectly employed in the work for the performance of contractor's part of this agreement, the contractor shall at his own expenses arrange for all safety provisions as per safety codes of C.P.W.D. Indian Standard Institution, the Electricity Act, The Mines Act and any such other acts as applicable.

ii) The Contractor shall ensure that he, his sub-contractor and his, or their personnel or representatives shall comply with all Fire/Safety regulations issued from time to time by the Company or otherwise howsoever and should any injury resulting in death or not or loss or damage due to Fire to any property or a portion thereof, occurred as a result of failure to comply with such regulations, the contractor shall be held responsible for the consequences thereof and shall keep the company harmless and indemnified.

91. A ARBITRATION:

a) Any dispute or difference of any nature whatsoever, any claim, cross-claim, counter-claim or set off of the Company against the Contractor or regarding any right, liability, act, omission or account of any of the parties hereto arising out of or in relation to this agreement shall be referred to and finally resolved by Sole Arbitrator, who shall be appointed by Director (Refinery) of BPCL as per the procedure given in sub-clause (b) given herein below.

b) Procedure for appointing the sole arbitrator: A party wishing to commence an arbitration (the "Claimant") shall file with the Director (Refinery) of BPCL a Notice of Arbitration which shall comprise:
   i. a demand that the dispute be referred to arbitration;
   ii. a reference to the arbitration clause or the arbitration agreement that is invoked and a copy of it;
   iii. a reference to the contract out of or in relation to which the dispute arises and where possible, a copy of it;
   iv. a brief statement describing the nature and circumstances of the dispute, specifying the relief claimed and, where possible, an initial quantification of the claim amount.
   v. any other details which the claimant wishes to refer and rely upon.

Upon receipt of the above notice of arbitration, the Director (Refinery) of BPCL shall appoint the Sole Arbitrator as per the provisions of the Arbitration and Conciliation Act, 1996.

c) The venue of arbitration shall be Mumbai (in case of Mumbai Refinery) or Kochi (in case of Kochi Refinery). The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to the agreement subject to the provisions of the Arbitration & Conciliation Act, 1996 or any statutory modification or re-enactment thereof and the rules made thereunder for the time being in force shall apply to the arbitration proceedings under this clause.
d) The arbitrator shall have power to order and direct either of the parties to abide by, observe and perform all such
directions as the arbitrator may think fit having regard to the matters in difference i.e. dispute, before him. The
arbitrator shall have all summary powers and may take such evidence oral and/or documentary, as the arbitrator in his
absolute discretion thinks fit and shall be entitled to exercise all powers under the Indian Arbitration & Conciliation Act
1996 including admission of any affidavit as evidence concerning the matter in difference i.e. dispute before him.

e) The parties against whom the arbitration proceedings have been initiated, that is to say, the Respondents in the
proceeding, shall be entitled to prefer a cross-claim, counter claim or set off before the Arbitrator in respect of any
matter in issue arising out of or in relation to the Agreement without seeking a formal reference of arbitration for such
counter-claim, cross claim, or set off and the Arbitrator shall be entitled to consider and deal with the same as if the
matters arising therefrom has been referred to him originally and deemed to form part of the reference made by the
Director(Refinery).

f) The arbitrator shall be at liberty to appoint, if necessary any accountant or engineering or other technical person to
assist him, and to act by the opinion so taken.

g) The arbitrator shall have power to make one or more awards whether interim or otherwise in respect of the dispute and
difference and in particular will be entitled to make separate awards in respect of claims of cross claims of the parties.

h) The arbitrator shall be entitled to direct any one of the parties to pay the costs to the other party in such manner and to
such extent as the arbitrator may in his discretion determine and shall also be entitled to require one or both the parties
to deposit funds in such proportion to meet the arbitrators expenses whenever called upon to do so.

i) The parties hereby agree that the courts in the city of Mumbai (in case of Mumbai Refinery) or Kochi (in case of Kochi
Refinery) alone shall have jurisdiction to entertain any application or other proceedings in respect of anything arising
under this agreement and any award or awards made by the Sole Arbitrator hereunder shall be filed (if so required) in
the concerned courts in the city of Mumbai (in case of Mumbai Refinery) or Kochi (in case of Kochi Refinery) only.

91.B SETTLEMENT OF DISPUTES BETWEEN PUBLIC SECTOR UNDERTAKING/ PUBLIC SECTOR ENTERPRISES/
GOVERNMENT DEPARTMENT:

i. If the CONTRACTOR is a Public Sector Undertaking or Enterprise or is a Government Department, any dispute or
difference between the parties hereto arising out of any notified claim of the CONTRACTOR in terms hereof and/or
arising out of any amount claimed by the OWNER (whether or not the amount claimed by the OWNER or any
part thereof shall have been deducted from the Final Bill of the CONTRACTOR or any amount paid by the OWNER
to the CONTRACTOR in respect of the work) which cannot be resolved amicably by mutual consultation or through
the good offices of empowered agencies of the Government, shall be referred to the Permanent Machinery of
Arbitrators of Department of Public Enterprises, New Delhi, under the guidelines issued by Government of India.
The Arbitration and Conciliation Act, 1996 or any other law for the time being in force shall not be applicable to the
arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the
dispute. However, any party aggrieved may file an appeal against the award before the Law Secretary,
Department of Legal Affairs, Ministry of Law and Justice, Government of India for setting aside the award published
by PMA. Upon such reference the dispute shall be decided by the Law Secretary whose decision on the appeal shall
bind the parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as
intimated by the Arbitrator.

ii. Notwithstanding the existence of any dispute or arbitration in terms hereof or otherwise, the CONTRACTOR shall
continue and be bound to continue and perform the works to completion in all respects according to the Contract
(unless the Contract or works be determined by the OWNER) and the CONTRACTOR shall remain liable and bound
in all respects under the Contract.

92. JURISDICTION :

The contractor shall be governed by the Laws in force in INDIA. The contractor hereby submits to the jurisdiction of
the Courts situated at Mumbai (Ernakulam-in the case of Kochi Refinery), for the purpose of actions and
proceedings arising out of the contract and the courts at Mumbai (Ernakulam-in the case of Kochi Refinery), only
will have jurisdiction to hear and decide such actions and proceedings.
Now this Agreement Witnesseth And, it is hereby agreed and declared as follows:

In consideration of the payment to be made to the contractor for the work to be executed by him, the contractor

The Owner accepted the Tender of the Contractor for the Provision and the execution of the said work at the rates

And whereas:

The materials including sand, gravel, stone, loose earth, rock etc., dug up or excavated from the said site shall, unless otherwise expressly agreed under this contract, exclusively belong to the Owner and the contractor shall have no right
to claim over the same and such excavations and materials should be disposed off on account of the Owner according to the instructions in writing issued form time by the Engineer-in-Charge.

In witness whereof the parties have executed these presents in the day the year first above written

Signed and Delivered for and on behalf of Owner i.e. Bharat Petroleum Corporation Limited

Signed and Delivered for and on behalf of Contractor (Name, designation and address of authorized signatory)

DATE................................................................. DATE.................................................................

PLACE................................................................. PLACE.................................................................

In Presence of Two Witnesses

BPCL witnesses – Signature, Name & Address:-

Contractor’s witnesses – Signature, Name & Address:-

1. ................................................................. 1. .................................................................

2. ................................................................. 2. .................................................................
ANNEXURE 2

PROFORMA OF BANK GUARANTEE for EARNEST MONEY /INITIAL/ FULL SECURITY DEPOSIT
(On non-judicial paper of appropriate value)

To,

Bharat Petroleum Corporation Ltd.
(Address)

Dear Sirs,

M/s. ______________________(hereinafter referred as “BIDDER”/“CONTRACTOR”) (Bidder’s / Contractor’s name and address) have taken tender for the WORK of _______________________ (Name of Work) for Bharat Petroleum Corporation Limited, with registered office in Bharat Bhavan, 4 & 6 Currimbhoy Road, Ballard Estate, Mumbai, India and having Refinery at .......(Mumbai / Kochi as the case may be) (hereinafter referred as “OWNER”).

The tender conditions provide that the BIDDER / CONTRACTOR shall pay a sum of Rs. _____________ (Rupees _____________________) as earnest money /initial/ full security deposit in the form therein mentioned .

The form of payment of earnest money / initial / full security deposit includes guarantee executed by schedule “A” Bank, undertaking full responsibility to indemnify OWNER in case of default. The said BIDDER/CONTRACTOR have approached us and at their request and in consideration of the premises, we _________________(Bank’s name) having our office at ________________ (hereinafter referred as “GUARANTOR’) have agreed to give such guarantee as hereinafter mentioned.

1. GUARANTOR hereby undertake and agree that if default shall be made by BIDDER / CONTRACTOR in performing any of the terms and conditions of the tender, GUARANTOR do hereby irrevocably bind themselves and undertake to pay the OWNER on first demand in writing by OWNER without protest or demur or proof or condition and without reference to the BIDDER / CONTRACTOR, the said amount of Rs. __________(Rupees ______________________) 

2. OWNER will have the full liberty without reference to GUARANTOR and without effecting this guarantee to postpone for any time or from time to time the exercise of any of the powers and rights conferred on OWNER under the tender with the said BIDDER/CONTRACTOR and to enforce or to forbear from endorsing any powers or rights or by reason of time being given to the said BIDDER / CONTRACTOR which under law relating to the sureties would but for provision have the effect of releasing the GUARANTOR.

3. OWNER will have the right to recover the said sum of Rs.___________________(Rupees ______________________) from GUARANTOR in manner aforesaid and such rights will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said BIDDER / CONTRACTOR and or that any dispute or disputes are pending before any officer, tribunal or court.

4. The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the said ________________(Bidder’s / Contractor’s Name).

5. GUARANTOR’S liability under this guarantee is restricted to Rs. __________(Rupees ______________________). This guarantee shall remain in force until ______________ unless a demand (3 months beyond bid validity) under guarantee is made against GUARANTOR within the aforesaid date, in which event the validity of this bank guarantee shall automatically be extended for another 3 (three) months, all rights under the said guarantee shall be forfeited and GUARANTOR shall be relieved and discharged from all liabilities thereunder.
6. GUARANTOR have power to issue this guarantee in your favour under Memorandum and Articles of Association and the undersigned has full power to do under the Power of Attorney dated ________________ granted to him by the Bank.

Yours faithfully,

_________________ Bank
by its Constituted Attorney.

Signature of a person duly authorized to
Sign on behalf of the bank.

NOTE: In case of earnest money, BIDDER shall be applicable and in case of initial / full security deposit, CONTRACTOR shall be applicable.
ANNEXURE 3

PROFORMA OF BANK GUARANTEE FOR MOBILIZATION ADVANCE
(On non-judicial paper of appropriate value)

To,

Bharat Petroleum Corporation Ltd.
(Address)

Dear Sirs,

In consideration of Bharat Petroleum Corporation Limited, with registered office in Bharat Bhavan, 4 & 6 Currimbhoy Road, Ballard Estate, Mumbai, India and having Refinery at .......(Mumbai / Kochi as the case may be) (hereinafter referred to as "The Company" which expression shall unless repugnant to the context or meaning thereof include its successors and assigns) having placed on Messrs._________________________ (Name) _______________ (Constitution) ________________________________ (address) (hereinafter referred to as "The Contractor" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, representatives and assigns) an order for mobilization advance (Name of July) and in terms of a Contract as evidenced by a Letter of Acceptance No. _______________ and/or Purchase Order No. _______________ dated _______________ (Maximum of 10% (ten percentage) of the contract value (hereinafter referred to as "MOBILIZATION ADVANCE") in the manner provided for in the Bidding Document) a sum of Rs.______________ (Rupees _______________ only) being the first / second installment (Delete whichever is not applicable) of Mobilization Advance upon the condition, inter-alia, that the said Advance together with interest thereon at the rate of 10% (10 percentage) per annum on reducing balance basis on the amount of the said Advance for the time being outstanding shall, without prejudice to any other mode of recovery available to the Company, be recoverable by the Company by deduction from the gross accepted amount of any Running Account Bills of the Contractor commencing from the first Running Account Bill of the Contractor in equal monthly installments together with the interest accrued within a time span of .......... Months in the manner provided for in the Bidding Document and meanwhile, the said Advance shall be secured by an undertaking from a Bank as hereinafter appearing.

AND WHEREAS the Company has agreed to advance the Contractor, inter-alia, recoverable interest bearing mobilization advance up to a maximum of 10% (ten percentage) of the contract value (hereinafter referred to as "MOBILIZATION ADVANCE") in the manner provided for in the Bidding Document, a sum of Rs.______________ (Rupees _______________ only) being the first / second installment (Delete whichever is not applicable) of Mobilization Advance upon the condition, inter-alia, that the said Advance together with interest thereon at the rate of 10% (10 percentage) per annum on reducing balance basis on the amount of the said Advance for the time being outstanding shall, without prejudice to any other mode of recovery available to the Company, be recoverable by the Company by deduction from the gross accepted amount of any Running Account Bills of the Contractor commencing from the first Running Account Bill of the Contractor in equal monthly installments together with the interest accrued within a time span of .......... Months in the manner provided for in the Bidding Document and meanwhile, the said Advance shall be secured by an undertaking from a Bank as hereinafter appearing.

We______________________________ (Name of the Bank), a body registered/constituted under the ____________ Act, having Registered Office/Head Office at______________________________ (hereinafter called the "Bank" which expression shall include its successors and assigns), at the request of the Contractor and with the intent to bind the Bank and its successors and assigns, do hereby unconditionally and irrevocably undertake to pay to the Company forthwith on first demand without protest or demur or proof or satisfaction and without reference to the Contractor, any and all amounts demanded from us by the Company with reference to this Undertaking upto an aggregate limit of Rs. _______________ (Rupees _______________ only) being 110% of the aforesaid advance and interest thereon at the rate hereinabove provided.

AND the Bank doth hereby further agree as follows: -

i) This Guarantee/Undertaking shall be a continuing guarantee and shall remain valid and irrevocable for all claims of the Company upon the Bank made up to the midnight of _______________ (contractual completion date) provided that the Bank shall upon the written request of the Company made upon the Bank at any time within 6 (six) months from the said date extend the validity of the Bank Guarantee by a further 6 (six) months so as to enable claims to be made under this Guarantee by a further 6 (six) months from the said date with the intent that the validity of this Guarantee shall automatically stand extended by a further 6 (six) months upon such request by the Company.

ii) The Company shall have the fullest liberty without reference to the Bank and without affecting in any way the liability of the Bank under this guarantee/undertaking, at any time and/or from time to time to amend or vary the contract and/or any of the terms and conditions thereof or relative to the said Advance and/or to extend time for performance of the said contract in whole or part and/or payment of the said Advance in whole or part or to postpone for any time and/or from time to time any of the said obligations of the Contractor and/or the rights, remedies or powers exercisable by the Company against the Contractor and either to enforce or forbear from enforcing any of the terms and conditions of or governing the said Contract and/or the said Advance, or the securities, available to the Company and the Bank shall not be released from its liability under these Present and the liability of the Bank shall remain in full force and effect notwithstanding any exercise by the Company of the liberty with reference to any or all the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, act or omission on the part of the Company or any indulgence by the Company to the Contractor or of any other act, matter or thing whatsoever which under any law could (but for this provision) have the effect of releasing the Bank from its liability hereunder or any part thereof and the Bank hereby specifically waives any and all contrary rights whatsoever.
iii) The obligations of the Bank to the Company hereunder shall be as principal to principal and shall be wholly independent of the Contract and it shall not be necessary for the Company to proceed against the Contractor before proceeding against the Bank and the guarantee/undertaking herein contained shall be enforceable against the Bank as Principal debtor notwithstanding the existence of any undertaking or security for any indebtedness of the Contractor to the Company (including relative to the said Advance) and notwithstanding that any such undertaking or security shall at the time when claim is made against the bank or proceedings taken against the Bank hereunder, be outstanding or unrealised.

iv) As between the Bank and the Company for the purpose of this undertaking, the amount stated in any claim, demand or notice made by the Company on the Bank with reference to this undertaking shall be final and binding upon the Bank as to be the amount payable by the Bank to the Company hereunder notwithstanding any dispute or disputes has been raised by the Seller and are pending before any arbitration, Tribunal or Court.

v) The liability of the Bank to the Company under this undertaking shall remain in full force and effect notwithstanding the existence of any difference or dispute between the Contractor and the Company, the Contractor and/or the Bank and/or the Bank and the Company or otherwise howsoever touching or affecting these presents or the liability of the Contractor to the Company, and notwithstanding the existence of any instructions or purported instructions by the Contractor or any other person to the Bank not to pay or for any cause withhold or defer payment to the Company under these presents, with the intent that notwithstanding the existence of such difference, dispute or instruction, the Bank shall be and remain liable to make payment to the Company in terms hereof.

vi) This undertaking shall not be determined or affected by any change in the constitution of the Bank or that of the Contractor or the Company or any irregularity in the exercise of borrowing powers by or on behalf of the Contractor.

vii) The Bank agrees that the guarantee herein contained shall continue to be enforceable till the sum due to the Company on account of the said advance is adjusted as aforesaid or till the Company discharges this guarantee.

viii) The Bank further undertakes not to revoke this guarantee during its currency without the previous consent of the Company.

ix) The Bank also agrees that the Company shall be entitled to enforce this guarantee, notwithstanding any other security or guarantee that it may have in relation to the vendor’s liability for the said advance.

x) Without prejudice to any other mode of service, a demand or claim or other communication may be transmitted by the Company to the Bank either by post or by fax. If transmitted by fax, the transmission shall be complete as soon as acknowledged by bank.

xi) Notwithstanding anything contained herein:
   (i) The Bank’s liability under this guarantee/undertaking shall not exceed ____________________________ (Amount in figures & words);
   (ii) This guarantee/undertaking shall remain in force upto______________ and any extension(s) thereof; and
   (iii) The Bank shall be released and discharged from all liability under this guarantee/undertaking unless a written claim or demand is issued to the Bank on or before______________ or the date of expiry of any extension(s) thereof if this guarantee/undertaking has been extended.

xii) This Guarantee shall be treated as an unconditional guarantee and the Contractor shall have no right to object or obstruct in any way the enforcement of this guarantee.

Yours faithfully,

Signature: ________________________________

Name & Designation: ________________________________

Name of the Branch: ________________________________

Dated: ________________________________
ANNEXURE 4
PROFORMA OF BANK GUARANTEE TOWARDS ADVANCE
(On non-judicial stamp paper of appropriate value)

To,

Bharat Petroleum Corporation Ltd.
(Address)

Dear Sir,

WHEREAS Bharat Petroleum Corporation Ltd. with registered office in Bharat Bhavan, 4 & 6 Currimbhoy Road, Ballard Estate, Mumbai, India and having Refinery at ……. (Mumbai / Kochi as the case may be) (hereinafter referred to as “the Corporation” which expression shall unless repugnant to the context include their legal representatives, successors and assigns, have entered into a contract (hereinafter referred to as “the Contract”) with M/s __________ (hereinafter referred to as “the Contractor”) having its registered office at _________________, and WHEREAS one of the conditions of the said contract is that the Corporation should make an advance payment to the Contractor (Rupees __________ only) being ……..% (………… percent) of the value of the contract against a bank guarantee from Schedule ‘A’ bank.

AND WHEREAS at the request of the contractor, the Corporation has agreed to accept the Bank Guarantee from __________ Bank (hereinafter referred to as the “Surety”) having their registered office at ____________________.

NOW THIS GUARANTEE WITNESSETH that in consideration of the Corporation having at the request of the Contractor agreed to accept bank guarantee of the Surety in respect of advance of Rs. ______ (Rupees __________ only) payable by the Corporation to the Contractor as per terms of the said contract, the Surety hereby undertake and agree that if the said amount advance payment shall become reduced and/or extinguished under terms of the contract between Corporation and Contractor, the Surety do hereby irrevocably bind themselves and undertake to pay to the Corporation on first demand in writing by the Corporation without protest or demur or proof of condition and without reference to the contractor, the amount not exceeding altogether a sum of Rs. _____ (Rupees __________ only) being the amount of advance payment or such other unadjusted amount of the said advance. The decision of the Corporation as to whether the terms and conditions of the Contract or this guarantee have been observed shall be final and binding on the Surety.

THE GUARANTEE HEREIN CONTAINED is not revocable during the currency of the contract and will remain in force until:

a) Payment has been made to the Corporation by the Surety of the aggregate amount payable hereunder.
b) The Contract for which this advance payment is being made is completed to the entire satisfaction of the Corporation and intimation thereof has been given to the Surety by the Corporation whichever is earlier.

NOTWITHSTANDING anything stated above, the liability of the Surety under this guarantee is restricted to Rs. _____ (Rupees __________ only) and this guarantee will remain in force up to ______ in the first instance and in case Contractor’s obligations under the contract are not completed within the said period, the Surety to hereby agree to further extend the guarantee till such time as is required to fulfill the Contractor’s obligation.

Our grantee shall remain in force until __________ unless a demand in writing for claim under this guarantee is lodged with us before that date i.e. on or before __________ all your rights under the said guarantee shall be forfeited and we shall be released and discharged from liability hereunder.

We have the power to issue this guarantee in your favour under Memorandum and Articles of Association and the undersigned has full power to do so under the Power of Attorney dated __________ granted to him by the bank.

_________________________
By its Constituted Attorney

________________________
Signature of Person duly
Authorised to sign on
Behalf of the Bank
ANNEXURE 5

TAX RESIDENCY CERTIFICATE

TRC obtained by the Non-resident from Government of foreign country shall contain the following particulars:

   i. Name of the assessee
   ii. Status (individual, company, firm, etc.) of the assessee
   iii. Nationality (in case of individual)
   iv. Country or specified territory of incorporation or registration (in case of others)
   v. Assessee’s tax identification number in the country or specified territory of residence or in case of no such number, then, a unique number on the basis of which the person is identified by the Government of the country or the specified territory
   vi. Residential status for the purpose of Tax
   vii. Period for which the certificate is applicable
   viii. Address of the applicant for the period for which the certificate is applicable
ANNEXURE 6

FORM NO. 10 F
[See sub-rule (1) of rule 21AB of the Income-tax Act, 1961]

Information to be provided under sub-section (5) of section 90 or sub-section (5) of section 90A of the Income-tax Act, 1961

1. I ___________________*son/daughter of Shri _____________ in the capacity of ___________________(designation) do provide the following information, relevant to the previous year _________, *in my case/in the case of __________ for the purposes of sub-section (5) of *section 90/section 90A:-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Nature of information</th>
<th>Details #</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Status (individual, company, firm etc.) of the assessee</td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>Permanent Account Number (PAN) of the assessee if allotted</td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>Nationality (in the case of an individual) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Country or specified territory of incorporation or registration (in the case of others)</td>
<td></td>
</tr>
<tr>
<td>(iv)</td>
<td>Assessee's tax identification number in the country or specified territory of residence and if there is no such number, then, a unique number on the basis of which the person is identified by the Government of the country or the specified territory of which the assessee claims to be a resident</td>
<td></td>
</tr>
<tr>
<td>(v)</td>
<td>Period for which the residential status as mentioned in the certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A is applicable</td>
<td></td>
</tr>
<tr>
<td>(vi)</td>
<td>Address of the assessee in the country or territory outside India during the period for which the certificate, mentioned in (v) above, is applicable</td>
<td></td>
</tr>
</tbody>
</table>

2. I have obtained a certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A from the Government of ___________________________(name of country or specified territory outside India).

Signature: __________________________
Name: _______________________________
Address: ____________________________
Permanent Account Number : ___________

Verification
I _________________ do hereby declare that to the best of my knowledge and belief what is stated above is correct, complete and is truly stated.

Verified today the ___________ day of _______________

Signature of the person providing the information

Place: ____________________________

Notes:
1. * Delete whichever is not applicable.
2. #Write N.A. if the relevant information forms part of the certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A.”.
ANNEXURE 7

Format of Integrity Pact
(To be executed on plain paper and applicable for all tenders of value above Rs. 1 crore)

INTEGRITY PACT

Between

Bharat Petroleum Corporation Limited (BPCL) hereinafter referred to as "The Principal",

And

………………………………………. hereinafter referred to as "The Bidder/ Contractor/Supplier"

Preamble

The Principal intends to award, under laid down organization procedures, contract/s for

…………………………… The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s, Contractor/s and Supplier/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organisation "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an Independent External Monitor (IEM) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above. Accordingly, the Principal has appointed Mr. ............ as IEM with the following address:-

Mr. ............

……………………

……………………

Tel: ......................

Section 1 – Commitments of the Principal

1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a) No employee of the Principal, personally or through family members, will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for himself/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

b) The Principal will, during the tender process, treat all Bidders with equity and reason. The Principal will, in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential / additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

c) The Principal will exclude from the process all known prejudiced persons.

2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder / Contractor / Supplier

1) The Bidder / Contractor / Supplier commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a) The Bidder / Contractor/Supplier will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person, any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange, any advantage of any kind whatsoever during the tender process or during the execution of the contract.
b) The Bidder / Contractor / Supplier will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

c) The Bidder / Contractor / Supplier will not commit any offence under the relevant Anti-Corruption Laws of India; further the Bidder / Contractor / Supplier will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder / Contractor / Supplier will, when presenting his bid, disclose any and all payments he has made, is committed to, or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2) The Bidder / Contractor / Supplier will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder, before contract award, has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1) If the Bidder/Contractor/Supplier has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is also entitled to exclude the Bidder / Contractor / Supplier from future Contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

2) A transgression is considered to have occurred if the Principal after due consideration of the available evidences, concludes that no reasonable doubt is possible.

3) The Bidder accepts and undertakes to respect and uphold the Principal’s absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

4) If the Bidder / Contractor / Supplier can prove that he has restored / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

Section 4 – Compensation for Damages

1) If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit/Bid Security.

2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor/Supplier liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

3) The Bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder / Contractor / Supplier can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount of the liquidated damages, the Bidder / Contractor/Supplier shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 – Previous Transgression

1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.
Section 6 – Equal treatment of all Bidders /Contractors /Suppliers/ Subcontractors

1) The Bidder/Contractor/Supplier undertakes to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors/Suppliers and Subcontractors.

3) The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Section 7 – Punitive Action against violating Bidders /Contractors / Suppliers/Subcontractors

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

Section 8 – Independent External Monitors

1) The Principal has appointed competent and credible Independent External Monitors for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

3) The Bidder/Contractor/Supplier accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Bidder/Contractor/Supplier. The Bidder/Contractor/Supplier will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Supplier/Subcontractor with confidentiality.

4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Bidder/Contractor/Supplier. The parties offer to the Monitor the option to participate in such meetings.

5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendation. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the Bidder/Contractor/Supplier to present its case before making its recommendations to the Principal.

6) The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the ‘Principal’ and, should the occasion arise, submit proposals for correcting problematic situations.

7) If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8) The word ‘Monitor’ would include both singular and plural.

Section 9 – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor/Supplier 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.

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

Section 10 – Other provisions

1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Mumbai. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
3) If the Bidder/Contractor/Supplier is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

For the Principal
For the Bidder/Contractor/Supplier

Place .................
Witness 1
(Signature/Name/Address)

Witness 2:
(Signature/Name/Address)

Date ................

We, M/s.__________________________________________________ having office at _______________________________ received the copy of GENERAL CONDITIONS OF CONTRACT and confirm our acceptance to all the terms and conditions as mentioned herein in this General Conditions of Contract and we are hereby returning this copy of Acknowledgement duly signed.

For & on behalf of M/s.____________________________________________________

Signature :
Name:
Designation: ________________________________ ( Seal / Stamp )
Place:
Date:
GENERAL TERMS & CONDITIONS

ALL THE CONTRACTORS ARE REQUIRED TO:

1. Enter into an agreement with BPCL as per the 'Memorandum of Agreement' attached with the tender document, in case of the award of the contract.

2. Abide by the Safety Regulations of our Refinery and in particular as mentioned in the booklet, General Fire and Safety Regulations - Part II (Latest Revision) as well as to ensure that safety equipment as stipulated in the Factories Act (Latest Revision) are used by their employees during the execution of the work. Failure to use safety equipment as required by our site supervisor will be a sufficient reason for cancellation of the contract. Also all site work may be suspended if it is found that the workmen are employing unsafe working practice and all the costs / losses incurred due to suspension of work shall be borne by the contractor.

3. Hold BPCL harmless and indemnified from and against all claims, cost and charges under Workman's Compensation Act, 1923 and 1933 and any amendment thereof and the contractor shall be solely responsible for the same.

4. Take at all times due and proper precautions against accident and injury to any of the workers or to any person or persons or property whether arising from or occasioned by your operations or otherwise and shall forthwith repair, make good and defray any damage, loss, cost or charge which may have been occasioned to the works or to the Company or to any person or persons or property injuriously affected thereby and shall be indemnified and save harmless and keep indemnified the company from and against all actions, suits, proceedings, claim and demands whatsoever by reason or on account thereof.

5. Abide by the 'Procedure governing entry / exit of contractor's personnel within Refinery premises. All the contractors employees shall be permitted to enter only on displaying of authorised photopasses issued by BPCL against requests made by the contractor.

6. Observe the timings of work as advised by BPCL Engineer-In-Charge for carrying out the contract work.

7. Remove grass / shrubs wherever required to carry out the work in a safe manner.

8. Clear the site on daily basis and cart away all debris / rubbish generated from the work, outside the Refinery and dispose it off without giving any impact to environment & rise to any complaints from local, Municipal or Government Authorities. The final bill will be passed for payment only after submission of Gate Pass for debris removed outside the Refinery for disposal.

9. Submit material incoming challans duly stamped by BPCL Security Staff at Main Gate to the concerned Dept. for material procured and brought inside by the contractors.

10. Prepare a sign board giving the following information and display it near the work site:

   a. Name of Contractor
   b. Job Description in short
   c. Date of start of job
   d. Date of expected completion
   e. Name of BPCL Supervisor

11. Return all the fire / safety and any other equipment taken on loan for executing the work to respective department, immediately, on completion of work.
12. Note that the entire contract work must be completed within the stipulated completion period as specified in the tender / contract documents. In case of failure, the liquidated damages clause as per the Memorandum of Agreement shall be applicable as specified in the contract documents.

13. Not to engage sub-contractor or sublet any part of the contract work without specific approval from BPCL.

14. Note that in case of failure of the contractor to carry out the work as per the terms and conditions of the contract, BPCL reserves the right to terminate the contract and / or get the work completed by engaging another agency at the risk and cost of the original contractor.

15. Vacate the space / shed allotted for the purpose of carrying out work as per the contract, immediately after completion of work and hand over the same to BPCL Engineer-In-Charge in clean condition.

16. Remove all the construction equipment / materials brought inside Refinery for carrying out the contract work immediately after completion of the work, outside Refinery premises as no storage of such item is allowed inside the Refinery.

17. Note that all the rates / prices as agreed at the time of award of contract shall remain firm during the entire period of contract and till all the contract work is completed and no escalation in prices shall be granted on account of any reason. Also the quoted item rates shall be inclusive of all applicable taxes and duties at prevailing rates.

18. Confirm the rates of recovery for all the materials issued from BPCL Warehouse on chargeable basis before submitting Material Issue Voucher, specially if the same is not indicated in the contract document.

19. Note that BPCL reserves the right to split the contract between two or more parties fully or partly in the interest of the job.

20. Supply the material as per the tender / contract documents and keep account of all the materials issued by BPCL as per contract to carry out final material reconciliation after completion of work. Any shortages / losses / wastages shall be charged to the contractor if they fail to reconcile all the material issued by BPCL.

21. Note that bills will be paid on the basis of actual executed quantities of work items after due certification of BPCL Engineer-In-Charge. The quantities indicated in the tender / contract documents are only estimated and shall not form basis for payment.

22. Obtain advance permission from the Engineer-In-Charge in writing for carrying out work on Sundays, holidays or working late hours beyond normal working time.

23. Be fully responsible for the indentity, conduct and integrity of the personnel / workers engaged by you for carrying out the contract work and ensure that none of them are ever engaged in any anti-national activity.

24. Understand the job fully by visiting the site, if necessary, and discussing with the concerned BPCL Engineer regarding details of the job, before submitting the offers.

25. Abide by the rules and regulations existing during the contract period as applicable for the contractors at BPCL Refinery.

26. Have valid PUC Certificate for all vehicles used inside the refinery premises by the Contractor for execution of the contract work.

***************
ADDITIONAL GENERAL TERMS & CONDITIONS

1. Notwithstanding the duration of the agreement, either party will have a right to terminate the agreement by giving not less than 90 days notice in writing to the other to expire at anytime, of its intention to terminate the same. BPCL shall however, be at liberty to terminate this agreement forthwith on the happening of any of the following events :-

   a. If you commit breach of any of the terms and conditions mentioned in the contract documents.

   b. If your services are not found satisfactory.

   c. If you commit or suffer to be committed any act which shall be prejudicial to the good name or interest of our Company.

   d. If you or your firm if adjudged insolvent or any of your partners commits any act of insolvency or a compromise is entered into by you / your partner with your creditors or if a distress execution or other process is levied upon property and assets or those of your partners.

   e. If you fail to render the services envisaged in the contract agreement.

   f. If for any act of yours, BPCL comes to the conclusion that it is not in our interest to continue with your service.

2. Should you stop providing services without giving atleast 90 days prior notice in writing, you will be liable to pay BPCL the damages / compensation including costs that the company may have to incur in making alternate arrangements for operating the services for a period of upto 90 days from the date of stoppage of services by you.

3. The duration of the contract will be one year or as mentioned in the Tender / Contract Documents.

4. BPCL reserves the right to extend the contract for a further period of 3 (three) months beyond the specified duration at the same rates and Terms and Conditions without seeking confirmation from the contractor.

5. The successful bidder shall give undertaking to Engineer-In-Charge about bonafides of the persons engaged by him for executing the job. In case of any violation of BPCL rules and regulations and / or Govt. legislation by any of the workmen, Contractor shall be responsible.

6. Contractor shall ensure that Gate Pass and other documents for workers working on a specific contract work are prepared against the same contract number.

***************
SPECIAL SAFETY CONDITIONS
(ESSENTIAL REQUIREMENT)

SAFETY CONDITIONS APPLICABLE TO ALL WORKS CARRIED OUT IN THE
REFINERY BY CONSULTANTS, CONTRACTORS OR OTHER THIRD PARTIES

1. COMPLIANCE WITH STATUTORY REQUIREMENT

Consultants, contractors or other third parties working in the refinery shall abide by :-

a) The safety regulations of the Refinery as mentioned in the ‘Fire and Safety Regulations’
   (Latest Revision)

b) All requirements under The Factories Act 1948 and the rules framed thereunder in
   the Maharashtra Factories Rules 1963 including all amendments thereto.

c) Applicable Environment Regulations in force and also the systems and procedures
   in the refinery related to environment.

2. QUALIFICATION AND EXPERIENCE OF MANPOWER TO BE DEPLOYED

Contractors shall deploy only experienced and qualified supervisors and workmen, who are well
conversant with the safety & environment regulations in the refinery.

The minimum qualification requirements of supervisors for field jobs (other than office jobs,
glass cutting, housekeeping, general cleaning jobs etc.) shall be :

- Diploma in relevant branch of engineering with 3 years experience or

- SSC + ITI in the relevant field with 10 years experience.

Also supervisors shall have sufficient knowledge of English language to understand Safety
Permit System, work instructions, drawings and they should be able to assimilate the safety
training inputs provided by the refinery and successfully qualify in the tests.

Past experience must be for same type of job for which the supervisors would be engaged.

Contractors’ skilled workmen like riggers, scaffolders, welders, fitters, crane operators, other
specialized equipment operators like welding machine, power generators etc. must have
sufficient past experience and skills on relevant jobs. The Electricians to be deployed on the job
must have valid Wireman Licence.

All workmen must be capable of following instructions and training.

3. HEALTH ASSURANCE

Contractors will ensure that workers including Supervisors before deployment on the job,
are medically examined by a certified surgeon / Occupational Health Physician having
qualification of MBBS + AFIH as per Rule 73 V of Maharashtra Factories Rule 1963.
Only medically sound persons as certified by the above medical practitioner would be
allowed on the job. Workmen deployed on high risk jobs like working in confined
space, working at height, working under water, etc. must also be certified as medically
fit for such jobs.

The medical certificates older by more than six months will not be accepted.
Health Assurance certificates submitted by the contractors would be periodically checked
at random by the refinery doctors.

4. RESTRICTIONS IN USE OF MAN POWER AND NORMAL TIMINGS FOR WORK

Contractor shall put all efforts to deploy minimum manpower to execute the work
awarded to him in stipulated time by using modern techniques & mechanization.
Contractors deploying minimum manpower will be given due weight while renewing their
registration.
No contractor’s employees shall normally work for more than 8 hours a day and not more than 48 hours in a week of seven days. After every 48 hours of working, all employees must get one full day’s rest. The normal duty timings for contractor’s employees shall be between 8.00 AM and 4.15 PM.

Contractor employees would not be allowed to work on Sundays and refinery holidays.

Any deviation from above shall be with express permission from the Engineer-in-charge.

5.0 TRAINING

5.1 Mandatory

Training in Fire and Safety is mandatory for all contractors’ employees before start of any work in the refinery.

5.2 Training of Contractors, Proprietors, Partners, Directors and Managers

a) The proprietors, partners, directors or managers in-charge of the contractors who have ultimate responsibility for their work in the refinery must undergo a one day comprehensive safety familiarization programme.

b) This programme would be conducted once in a quarter by fire and safety department at fire station auditorium and the schedule shall be notified well in advance.

c) On completion of the programme a certificate of attendance will be issued to each participant which will be required for issue of refinery entry pass.

5.3 Supervisors’ Training

a) Contractors’ supervisors will have to undergo two days training on “Health, Safety and environment (HSE) in Refinery” followed by one day training on “Work Permit System”.

b) At the end of each of the above two training modules, there will be a written test.

c) Passing certificates would be issued on the last day of the month to the supervisors who successfully pass these tests.

d) The Passing Certificate issued to a supervisor would remain valid for one year.

e) Refinery Entry Pass will not be issued to any supervisor without a valid Passing Certificate.

5.4 Workers’ Training

a) Contractors workmen will have to undergo one day’s class room training on “Safety in Refinery” before commencement of the job.

b) On completion of this training, “Certificate of Attendance” would be issued by safety section.

c) This “Certificate of Attendance” would remain valid for a period of one year.

d) Refinery Entry Pass would be issued only on production of this certificate.

5.5 Refresher Training

a) Supervisors workmen will be required to undergo refresher training from time to time as required by the safety section.

b) The coverage and methodology of the refresher training would be same as the initial training.
5.6 Administration of Training

a) The Refinery Fire and Safety Department shall conduct these mandatory training programmes at the Fire Station auditorium or any other venue as decided by BPCL, free of cost.

b) One three-day training programme around the middle of every month for supervisors and three one-day training programmes for workmen at an interval of 10 days will be conducted.

c) Notice giving schedule of exact dates of training for the current month would be issued to Maintenance Planning, Office Engineering & Construction, Contracts and Purchase and the Estates (P&A) by 25th of the previous month for notification to the contractors.

5.7 Contractors Responsibility for Training his employees

a) Contractor must ensure that all his supervisors have undergone safety training and keep documents of such training. He shall also ensure that each of his employees has received and understood from his supervisors necessary training on safety for working in the refinery.

b) Contractor must maintain records of training provided by him to his employees. Such records must clearly mention a) what training has been provided, b) date, time and duration of such training, c) who has provided the training, d) names of workers who attended such training etc.

c) The records maintained in the form of a register must be available for examination by the Engineer-in-charge or his representative who will sign on the register as a token of his approval.

d) The training provided by the contractor must be as frequent as possible but there should not be more than 15 days gap in between two training programmes.

e) The training provided by the contractor is expected to be on-the-job training and must not be less than at least one hour duration. During such training, contractor must make himself present and facilitate the process of the training.

6. ISSUE OF REFINERY ENTRY PASS

On award of a contract and prior to commencement of work the Contractor must

a) Fill in the Form as per annexure-I attaching all necessary documents (viz. Bio-data as per Annexure - II, medical certificate, etc.) of each employee as mentioned in the form.

b) Submit the form to the engineer-in-charge and obtain his recommendation.

c) Thereafter, submit the form to IR department for Form V for obtaining labour licence.

d) Obtain labour licence and complete ESIC and PF related formalities.

e) Submit ESIC, PF and Labour Licence details to IR and obtain clearance from IR officer.

f) Submit the form duly cleared by the Engineer-in-charge and IR officer, to the Safety Officer.

g) Ensure completion of safety training by all supervisors and workmen, as per requirement as spelt out in Clause nos. 5.3 & 5.4 of these Conditions of Contract

h) Obtain clearance of the Safety Officer regarding completion of safety training.

i) Submit the form to CISF (at Refinery Main Gate) and obtain Refinery Entry Pass for those supervisors and workers who have been cleared by all agencies.
7. **OBLIGATION TO FOLLOW WORK PERMIT SYSTEM**

a) Do not carry out any work without a valid work permit issued by authorized persons in the refinery, as per Work Permit System.

b) After obtaining a valid work permit and before the actual commencement of the work, also obtain a clearance certificate from the officer of the unit/plant where the work is to be carried out.

c) Register permit and clearance at refinery fire station as required under the Work Permit System.

d) Comply with all the Fire/Safety/Excavation/Radiography permit conditions specified in the permit and the clearance.

e) Prepare a safety action plan specific to the work before starting the work. Also ensure that all supervisors and workers involved in the work, properly understand and follow the safety action plan.

f) Display permit / clearance at site for checking, by refinery officials whenever required.

8. **REQUIREMENT OF SUPERVISION**

a) Contractor will not carry out any work without having a supervisor present at site. If it is required to work simultaneously in more than one location under the same contract, one supervisor must be put in each of the locations. If a supervisor has to leave his site for any reason, he must stop his site activities for that period of time.

b) Contractor must provide at least one full time onsite safety supervisor when the contractor has engaged a manpower in excess of 50 in contract activities in the Refinery. If the manpower is less than 50, the on-site safety co-ordination responsibilities shall be assumed by any one of the contractor’s other supervisory staff. In both the cases, the contractor must specify in writing the name of such persons to the Engineer-in-Charge and Manager Safety.

c) Contractor’s safety co-ordinator or his supervisor responsible for safety as the case may be, shall conduct at his work-site and document formal safety inspections and audits at least once in a week. Such documents are to be submitted to Engineer-in-Charge for his review and record.

d) Contractor’s safety supervisor or the supervisor responsible for safety, shall maintain separate safety register which will include 1) List of activities being carried out at site; 2) Safety Training details of all supervisors and workmen; 3) Records of all accidents, first aid cases and near misses; 4) Records of all PPE's being used at site; 5) Records of lifting tools and tackles including slings of all types; 6) Records of pressure vessels if any at his site; 7) Records of all welding machines, gas cutting sets, compressors, generators, pressure regulators, portable power tools, hand tools etc. 8) Copies of safety inspection reports made by the Contractor safety supervisor as well as by the BPCL refinery.

e) The contractors whose safety records are not satisfactory will be viewed seriously and necessary action (viz. cancellation of Registration/Contracts) shall be taken against him.
9. USE OF PERSONAL PROTECTIVE EQUIPMENT

Contractor's all supervisors and workmen must use following Personal Protective Equipment (PPE's) without which, permission to work will be denied.

a) Hard Hat  b) Safety Shoes  c) Boiler Suits  d) Hand Gloves as per job requirement  e) safety belt as applicable  f) Eye protection goggles etc.

The PPE's shall be of standard quality and ISI approved.

Only Special Protective Equipment like "Breathing Apparatus Set" and Fire Extinguishers shall be provided by BPCL to the contractor, on loan basis. If the same is not returned after completion of the contract or damaged beyond repair, recovery as appropriate will be made from his dues, from the company.

10. HAZARD COMMUNICATION

a) Contractor must familiarize himself from BPCL Engineer-in-Charge about all known potential fire, explosion or toxic release hazards related to his contract. He in turn will ensure that same information has been passed to his supervisors and workmen. Proper record of such dissemination of information must be made by the contractor and submit to the Engineer-in-Charge on demand, failing which further continuation of work may be withheld.

b) In the event of any contractor's employee spotting a fire or any serious hazards in refinery premises, he shall dial Ext. No-3333, identify himself and report location of fire when Fire Station Operator is on the line. He shall wait until the fire message is repeated by the Fire Operator and location confirmed.

c) The contractor must ensure that each one of his employees clearly understands this Fire Communication Requirement. This may be ensured by the contractor while providing on the job training.

11. INJURY NOTIFICATION AND INVESTIGATION

Contractor must

a) Report to BPCL supervisor on - the - job any injury sustained by any of his employees or any near miss or any hazardous / dangerous incident at his work site within the Refinery premises. Hiding of any accident or near miss would be viewed as serious misconduct.

b) Arrange to provide FIRST AID immediately to the injured employee.

c) Keep and maintain proper records of all such incidents in respect of his personnel/ worksite.

d) Submit to the Engineer-In-Charge, a first information report as per prescribed Proforma within 4 hours of the incident.

e) Arrange to immediately investigate the incident and furnish within 24 hours a written investigation report in prescribed Proforma to BPCL Engineer-In-Charge.

12. REQUIREMENT OF HOUSE KEEPING

Contractor must ensure highest standard of housekeeping in his area of work on a day-to-day basis. An unsatisfactory housekeeping will earn negative rating, which will attract penal actions like cancellation of registration / contract.
13. **REQUIREMENT DURING SUBMISSION OF TENDER**

Contractor must submit along with his tender:

a) Complete work injury records, per year, for the last three years.

b) Total man-hours worked, per year, for the last three years.

c) Safety assurance plan.

Quotation must clearly indicate the number of Supervisors and skilled or unskilled workers, which will be deployed for the job, from time to time during execution of the contract.

The above information will be taken into view during tender evaluation.

14. **DISPLAY BOARDS AT SITE**

Contractor must provide and maintain in his worksite:

a) Appropriate display board displaying information as per BPCL “Work Site Display Board” specification.

b) Safety performance score board.

15. **PARTICIPATION IN SAFETY ACTIVITIES**

Contractor must attend all scheduled safety meetings as would be intimated to him by the Engineer-In-Charge.

Contractor also must ensure that all his employees participate in safety promotional activities organized in the refinery.

16. **NOTE**

da) Every person other than a BPCL employee or a casual visitor, entering in the refinery, would be governed by the above conditions.

b) The term supervisor would mean any person who oversees the work of a group of workmen. All other persons would be considered as workmen.

c) Violation of any of the above special conditions of safety would attract penal actions including termination of the contract/registration.

d) Meticulous adherence to these requirements would be documented by the Engineer-In-Charge on conclusion of the work and placed in the dossier of the contractor. This performance would be given adequate weightage at the time of renewal of the registration.

e) Any dispute arising out of these conditions shall be referred by the Engineer-In-Charge to the Head of the refinery Fire and Safety department.

17. All guidelines as mentioned in OISD Guidelines 207 shall be strictly complied with. Copy of the same is available with Fire & Safety Department.
MONTHLY GATE PASS RECOMMENDATION

(Temporary Gate Pass for Contractor's Employees)

Month: ____________________ Name of Contractor: ____________________

Work Order No.: _______________ Contract Duration: _______________ Day/Months

Nature of Work: ______________________________________________________

Labour Licence No. / Validity Period / Max. No. of Workers Permissible: __________


Provident Fund Challans of Last Month Enclosed: Yes/No


Copy of ESIC Challans of Last Month Enclose: Yes/No

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name</th>
<th>Designation (State the type of work done viz. Supervisor/ fitter/rigger/unskilled helper etc.)</th>
<th>ESIC No.</th>
<th>PF No.</th>
<th>Bio Data Attached (Yes/No)</th>
<th>Medical Certificate Attached (Yes/No)</th>
<th>Safety Training (This Column to be signed by the Safety Office)</th>
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<td></td>
<td>Passed &amp; Certificate issued (for Supervisors Only)</td>
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<td>Attended &amp; Certificate issued (for workmen)</td>
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I certify that the above particulars furnished by me are true.

Signature & Date of Contractor: ____________________ Name: ____________________

Engineer-in-Charge

(to recommend the no. of contract labour required for the work is ok)

Name: ____________________ Signature: ____________________

IR Department

(to check qualification/experience as submitted in Bio-data are as required and also whether medical certificates are attached)

Name: ____________________ Signature & Date: ____________________

CISF

(to check all certifications as above, have been made before issue of pass. Documents will be filed by CISF)

Refinery Entry Pass issued from: _______________ to: _______________

Name: ____________________ Signature & Date: ____________________
BIO-DATA OF CONTRACTOR'S EMPLOYEES

NAME : [Insert Name]
AGE : [Insert Age]
TRADE : [Insert Trade]
RESIDENTIAL ADDRESS : [Insert Address]
TEMPORARY : [Insert Temporary Address]
PERMANENT : [Insert Permanent Address]
LANGUAGES KNOWN : [Insert Languages]
SPEAK : [Insert Languages]
READ : [Insert Languages]
WRITE : [Insert Languages]
QUALIFICATION : [Insert Qualification]
TRAINING IN SAFETY : [Insert Training]
HEALTH/ENVIRONMENT : [Insert Health/Environment]
QUALITY/TRADE : [Insert Quality/Trade]

JOB EXPERIENCE :

DATE : [Insert Date]
SIGNATURE : [Insert Signature]

<table>
<thead>
<tr>
<th>WITNESS</th>
<th>NAME</th>
<th>SIGNATURE</th>
<th>ADDRESS</th>
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<tr>
<td>1</td>
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***************
FINANCIAL DETERRENT FOR VIOLATION OF SAFETY NORMS BY CONTRACTORS
(APPLICABLE TO ALL WORKS CARRIED OUT IN THE REFINERY BY CONTRACTORS)

All contractors working inside Refinery have to strictly follow safety norms as per BPCL rules and regulations. Contractors who are violating safety norms while executing the job will be penalized financially. Penalty amount and Reporting Authority for violation / non adherence of various safety norms is given below.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>VIOLATION OF HSE NORMS</th>
<th>PENALTY AMOUNT</th>
<th>REPORTING AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Working without proper Authorisation / Permit (Cold work)</td>
<td>Rs 6000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>2.</td>
<td>Hot work without proper Authorisation/ Permit</td>
<td>Rs. 12000/- per occasion and delisting / holiday listing of 3 years if repeated.</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>3.</td>
<td>Violation of any of the conditions specified in the permit</td>
<td>Rs 2000/- per permit.</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>4.</td>
<td>Use of mechanically propelled equipment/engine/generator set without/ with faulty spark arrestor</td>
<td>Rs. 1000/- per equipment</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>5.</td>
<td>Non-display of name board, permit etc., at site</td>
<td>Rs 600/- per location where job is being executed. Penalty will be repeated if not rectified within 3 days.</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>

VIOLATION OBSERVED WHILE WORKING AT HEIGHT

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>VIOLATION OF HSE NORMS</th>
<th>PENALTY AMOUNT</th>
<th>REPORTING AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Working at height without safety belt arrangement as required i.e. without safety belt / Non use of double lanyard safety belt.</td>
<td>Rs 1000 / per person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>7.</td>
<td>Throwing up/down any material from height or not making proper provision to bring down material safety from height</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>8.</td>
<td>Non standard/unsafe platform/ladder</td>
<td>Rs. 2000/- per case per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
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</tbody>
</table>

w.e.f. 01.04.2014
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<thead>
<tr>
<th></th>
<th>Violation</th>
<th>Penalty</th>
<th>Responsible Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Non standard/unsafe Scaffolding</td>
<td>Rs. 2000/- per case per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>10.</td>
<td>Use of Uncertified Scaffolding</td>
<td>Rs. 2000/- per case per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
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<tr>
<td></td>
<td><strong>NON USE OF PERSONAL PROTECTIVE EQUIPMENT</strong></td>
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<td>11.</td>
<td>For not using Non Respiratory Personal Protective Equipment (Helmet, goggles, gloves, safety belts, Boiler suit etc, Shoes )</td>
<td>Rs. 1000/- Per day/person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>12.</td>
<td>For not providing Respiratory -Personal Protective Equipment prescribed in Work permit/job safety plan /B.A. set/canister mask/B.A. compressor etc)</td>
<td>Rs. 5000/- per case per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
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<td></td>
<td><strong>VIOLATION OBSERVED IN ELECTRICAL WORK</strong></td>
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<td>13.</td>
<td>Non use of ELCB , using poor joints of cable, using naked wire without top plug into the socket , laying wire/cables on the roads, carrying out electrical jobs by incompetent person</td>
<td>Rs 5000/- per item per day</td>
<td>Chief Maint Manager (Elect), Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>15.</td>
<td>Working/ on live electrical circuits without work permit/authorization</td>
<td>Rs. 5000/- per case per day</td>
<td>Chief Maint Manager (Elect), Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
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<tr>
<td></td>
<td><strong>VIOLATIONS IN EXCAVATION WORK</strong></td>
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<tr>
<td>16.</td>
<td>Unsatisfactory fencing / barricading of excavated areas,</td>
<td>Rs. 2000/- per item per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
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<td>Not providing proper shoring / strutting / proper slope and</td>
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<td>Not keeping the excavated earth at least 1.5 M away from excavated area</td>
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<td></td>
<td><strong>VIOLATIONS OBSERVED IN ROAD SAFETY</strong></td>
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<tr>
<td>17.</td>
<td>Driving BPCL or Contractor’s vehicle without authority from transport operations.</td>
<td>Rs. 1000/- per case</td>
<td>Any employees through Head of Dept (F&amp;S)</td>
</tr>
<tr>
<td>18.</td>
<td>Over speeding of jeeps / buses, rash driving, wrong side parking.</td>
<td>Rs. 2000/- per item</td>
<td>Any employees through Head of Dept (F&amp;S)</td>
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<td></td>
<td>Offence Description</td>
<td>Fine</td>
<td>Responsible Officer</td>
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<tr>
<td>19.</td>
<td>Driving hydra/Grane/fork lift above its speed limit fixed for BPCL refinery roads or Driving hydra without being escorted by cleaner who is sitting left side of the driver to guide him</td>
<td>Rs. 1000/- per case</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>20.</td>
<td>Entry of contractor's vehicle in No Entry Area without proper authorization.</td>
<td>Rs. 1000/- per case</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>21.</td>
<td>Entry of any person in barricaded area marked with tape.</td>
<td>Rs. 1000/- per person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>22.</td>
<td>Riding on material handling vehicles or trolleys</td>
<td>Rs. 500/- per case</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>23.</td>
<td>Sitting or allowing sitting along with the driver on fork lift.</td>
<td>Rs. 500/- per case</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>24.</td>
<td>Vehicle Accident- i.e. overturning, falling in pits, damaging equipment, hitting another vehicle etc.</td>
<td>Rs 5000/- per case plus replacement/repair charges incurred by BPCL for BPCL owned material</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>

**NON DEPLOYMENT OF REQUIRED MANPOWER**

<table>
<thead>
<tr>
<th></th>
<th>Offence Description</th>
<th>Fine</th>
<th>Responsible Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td>Non-deployment of safety supervisor / supervisor responsible for safety at work site required as per Special Safety Conditions</td>
<td>Rs2000 per person per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>26.</td>
<td>Failure to maintain safety register and record by Contractor Safety Supervisor or Supervisor responsible for safety</td>
<td>Rs.2000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>27.</td>
<td>Failure to have weekly safety site inspection / audit and monthly safety meeting and maintain record (by contractors themselves)</td>
<td>Rs. 2000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S</td>
</tr>
<tr>
<td>28.</td>
<td>Failure to conduct tool box meeting every day and maintain the records of the same.</td>
<td>Rs. 500/- per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>29.</td>
<td>Failure to submit the monthly HSE report by 5th of next month to Engineer-in-charge</td>
<td>Rs. 200/- per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>

**VIOLATION OF STATUTORY REQUIREMENT**

<table>
<thead>
<tr>
<th></th>
<th>Offence Description</th>
<th>Fine</th>
<th>Responsible Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.</td>
<td>Acting in contravention to any of the provision mentioned in Factories Act 1948 and/or the rules framed there under including all amendments thereto.</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>
### OCCURRENCE OF INDUSTRIAL ACCIDENTS

**31.** Failure to maintain records as per statutory requirement like
- Form No. 1A – for the shed/s constructed by contractor
- Form No. 6 – Certificate of fitness
- Form No. 10 – Register of workers attending machinery
- Form No. 11 – Report of Examination of Hoist/Lift/Lifting tackle
- Form No. 13 – Report of Examination of any pressure vessel brought by the contractor to refinery site
- Form No. 16 – Notice of periods of works for adult workers
- Form No. 17 – Register of adult workers
- Form No. 23 – Special certificate of fitness

Rs. 10000/- per occasion

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**32.** Failure to furnish a first information report (FIR) as per prescribed Pro-Forma within 4 hours of the incident.

Rs. 1000/- per occasion

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**33.** Failure to arrange immediate investigation / evidences / documents of the incident and furnish within 24 hours to BPCL Engineer-In-Charge.

Rs. 1000/- per occasion

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**34.** Keep and maintain proper records of all incidents occurred at work site

Rs. 1000/- per occasion

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**35.** Failure to report to BPCL supervisor on the job, medical centre and area safety officer any injury to his employees or any near miss or any hazardous/dangerous incident at work site within the Refinery premises or hiding of any accident or near miss.

Rs. 5000/- per occasion

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**36.** Negligence on contractor’s part which has resulted in an Injury/fire

- Lost Time Injury
- Fatality

Rs. 1,00,000/- per person

Rs. 5,00,000/- per person

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**37.** Negligence on contractors part which has resulted in Minor Fire/Explosion/ etc Major Fire (Reportable)

Rs. 1,00,000/-

Rs. 2,00,000/-

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

### VIOLATION OF LABOUR LAWS

**38.** Working beyond statutory limits by contractor’s workers

Rs. 1000/- per person per day

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
|

**39.** Deployment of contractor’s employees including supervisors without receiving necessary training on safety for working in the refinery.

Rs. 5000/- per person per day and holiday listing of contractor for 6 months if repeated

| Engineer-in-charge, Head of Dept. F&S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&S), Section Head Estates
<p>|</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Violation Description</th>
<th>Penalty</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.</td>
<td>Deployment of contractor's employees including supervisors without undergoing their medical examination, by the authorized medical professional having qualification of MBBS + AFIH. Deployment of workers on high risk jobs like working in confined space, working at height, working under water, etc. without being examined and certified as medically fit for such jobs by the doctors who are authorized to certify for such jobs.</td>
<td>Rs. 1000/- per person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>41.</td>
<td>Non subjecting to periodic medical examination after every six months after deployment of workers including supervisors on the job by the certifying surgeon as per Rule 73V of Maharashtra Factories Rule 1963.</td>
<td>Rs. 1000/- per person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>42.</td>
<td>Deployment of child or adolescent</td>
<td>Rs. 10,000/- per person</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>43.</td>
<td>Use of untested and uncertified pressure vessel.</td>
<td>Rs. 5000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>44.</td>
<td>Use of untested and uncertified lifting tools/tackle</td>
<td>Rs. 5000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>45.</td>
<td>Improper material handling/Manually handling of heavy material when it is require using mechanical equipment/use of substandard/defective material handling trolleys/hand cart.</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>46.</td>
<td>Failure to submit duly filled pre use check list for any new machine or equipment brought at site</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>47.</td>
<td>Inadequate supervision at work site( absence of supervisor/designated employee as supervisor from site for more than 30 Minutes when work is in progress)</td>
<td>Rs. 2000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>48.</td>
<td>Safety performance score board not displayed.</td>
<td>Rs. 100/- per day</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>49.</td>
<td>Unsafe handling of compressed gas cylinders No trolley or jubilee clips or double gauge regulator or flash back arrestor on both gas lines &amp; both ends or improper storage / handling or cylinders without caps when not in use/damaged hoses)</td>
<td>Rs. 500/- per item per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>

w.e.f. 01.04.2014
## VIOLATIONS DURING RADIOGRAPHY PROCESS

<table>
<thead>
<tr>
<th>Violation</th>
<th>Fine</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>50. Radiography without authorization</td>
<td>Rs. 10000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>51. Non barricading the area during radiography</td>
<td>Rs. 10000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>52. Non announcement on PA system/alerting people working in vicinity, before start of Radiography jobs</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>

## MISCELLANEOUS

<table>
<thead>
<tr>
<th>Violation</th>
<th>Fine</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>53. Damage to fire hydrant &amp; monitors, fire extinguishers including non return of extinguishers</td>
<td>Cost incurred by BPCL for repair/replacement</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>54. Poor House-keeping</td>
<td>Rs. 5000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>55. Removal of grating/cover/lid on any opening in floor or vessel.</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>56. Use of dangerous portable tools/hand tools like grinding machine, drilling machine, pneumatic excavators/drill by unskilled worker.</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>57. Operating/allow to operate any machine without having guard on its dangerous/rotating part of the machine or an equipment.</td>
<td>Rs. 1000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>58. Horseplay at work site</td>
<td>Rs1000 /- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>59. Shifting of debris from one location to another/ dumping debris at unauthorized place.</td>
<td>Rs. 10000/- per occasion</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
<tr>
<td>60. Use of mobile in plant areas</td>
<td>Rs 1000/- per person per occasion.</td>
<td>Engineer-in-charge, Head of Dept. F&amp;S, Head of Dept. (Process/PD/Maint./MM PL/Tech./CS&amp;S), Section Head Estates</td>
</tr>
</tbody>
</table>
Please note that:

1. The above penalties will be applicable for all the contracts jobs carried out inside Refinery and covered by BPCL HSE norms / work permit system.

2. Site Engineers, Operations Officers, Safety Officers will report such violation through their Department Head /Engineer-in-charge (Reporting Authority) to the respective contracting department (P&CS/RMP) for necessary action. Reporting Authority has been indicated against each violation.

3. On advice from Reporting Authority, respective contracting departments shall make the deductions from the next payment due to the contractor.

4. The above penalties shall be double in case of violations more than 3 times during the contract period for a particular contract. For annual and other rate contracts POs awarded as part of rate contract shall be considered for this.

5. In case of frequent penalties for a particular contractor, necessary action such as holiday listing / delisting will be taken.

6. In addition to the safety conditions mentioned in Special safety Conditions attached, contractors are required to adhere to the following additional safety requirement for which penalties are applicable as above for violation of these conditions:
   a. All contractors shall themselves arrange weekly safety site inspection / audit and monthly safety meeting and record should be maintained.
   
   b. All contractors shall submit monthly HSE report to respective Engineer-In-Charge by 5th of next month. Report should carry details of precautions against accident and injury to any of the workers or to any person or persons or of weekly safety site inspection / audit, monthly safety meeting, details about records maintained by Safety Supervisor and any other information felt necessary by Engineer-in-Charge for safe execution of job.

7. Implementation of above financial penalties for violation of HSE norms does not absolve contractors from their responsibilities to take at all times due and proper precautions to avoid injuries and accidents.

8. Contractors shall own the full responsibility for any accident and injury to any of the workers or to any person or persons or property arising due to violation of HSE norms by contractors even though financial penalty is not applied for such violation. Implementation of these financial penalties does not absolve Contractors from any of the responsibility as per General Contract Conditions (Latest Revision), General Terms and Conditions and Special Safety Conditions.

9. All such financial penalties imposed on contractors shall be displayed / publicized appropriately by the respective Contracting department.

*****
POLICY OF HOLIDAY LISTING OF VENDORS IN BPCL
1. **Definitions:**

In these Guidelines, unless the context otherwise requires

(i) **Agency:** “Party/Contractor/Supplier/Vendor/Consultant/Bidder/Licensor” in the context of these guidelines is indicated as ‘Agency’;

(ii) **Appellate Authority:** “Appellate Authority” shall mean the concerned functional Director of BPCL or any other authority nominated by the C & MD. The Appellate authority shall be higher than the “Competent Authority”.

(iii) **Competent Authority:** “Competent Authority” shall mean the authority, who is competent to take final decision for Banning of business dealings with Agencies, in accordance with these guidelines:

(iv) **Corporation:** “Corporation” means Bharat Petroleum Corporation Ltd. with its Registered Office at Bharat Bhavan-I, 4&6 Currimbhoy Road, Ballard Estate, Mumbai-400001.

(v) **Corrupt Practice:** “Corrupt Practice” means the offering, giving, receiving or soliciting, directly or indirectly, anything of value to improperly influence the actions in selection process or in contract execution. Corrupt Practice also includes any omission for misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.

(vi) **Fraudulent Practice:** “Fraudulent Practice” means and include any act or omission committed by a agency or with his connivance or by his agent by misrepresenting/submitting false documents and/ or false information or concealment of facts or to deceive in order to influence a selection process or during execution of contract/order;
(vii) Collusive Practice: “Collusive Practice” amongst bidders (prior to or after bid submission)” means a scheme or arrangement designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

(viii) Coercive Practice: “Coercive practice” means impairing or harming or threatening to impair or harm directly or indirectly, any agency or its property to influence the improperly actions of an agency, obstruction of any investigation or auditing of a procurement process.

(ix) Officer-in-Charge: “Officer –in-Charge (OIC)” or “Engineer-in-Charge (EIC)” shall mean the person (s) designated to act for and on behalf of BPCL for the execution of the work as per requirement of the concerned department.

(x) Malpractice : Malpractice means any Corrupt Practice, Fraudulent Practice, Collusive Practice or Coercive practice as defined herein;

(xi) Mis-Conduct : “Mis-conduct” means any act or omission by the Agency, making it liable for action for Holiday Listing as per these guidelines

(xii) Nodal Department: “Nodal Department” means the Department primarily assigned with the role of overseeing the Holiday Listing Process to ensure adherence to guidelines, maintaining, updating and publishing the list of Agencies with whom BPCL has decided to ban business dealings and shall be the Corporate Finance Department.

(xiii) Vendor De-listment Committee: “Vendor De-listment Committee” relevant to the procurement department which initiates the holiday listing process would be the same as the vendor enlistment Committee as per DR&A of the concerned SBU/Entity.

2. **Reasons for Holiday Listing**

   An Agency may be placed in Holiday List for any one or more of the following circumstances:

   **2.1 If the Agency, in the context of its dealings with the Corporation:**

   a. has indulged in malpractices ;
   b. has submitted fake, false or forged documents / certificates
c. Has substituted materials in lieu of materials supplied by BPCL or has not returned or has unauthorized disposed off materials / documents / drawings / tools or plants or equipments supplied by BPCL.
d. Has deliberately violated and circumvented the provisions of labor laws/ regulations / rules, safety norms, environmental norms or other statutory requirements.
e. has deliberately indulged in construction and erection of defective works or supply of defective materials
f. Has not cleared previous dues to BPCL if applicable.
g. Has committed breach of contract or has abandoned the contract.
h. Poor performance of the Agency in one or several contracts;
i. Has not honored the fax of award / letter of award / Contract / Purchase order after the same is issued by BPCL.
j. Withdraws/ revises the bid upwards after becoming the L1 bidder.
k. Has parted with, leaked or provided confidential / proprietary information of BPCL to any third party without the prior consent of BPCL.

2.2 The following additional grounds can also be reasons for Holiday listing of an agency:
a. If a communication is received from the Administrative Ministry of the Corporation (i.e. MOP&NG) to ban Agency from dealing with the Corporation;
b. If the Agency Is or has become bankrupt, OR is being dissolved OR has resolved to be wound up OR if proceedings for winding up or dissolution has been instituted against the Agency;
c. Any other ground, including transgression of Integrity Pact, which, in the opinion of the Corporation, makes it undesirable to deal with the Agency; In the case of transgression of Integrity Pact, the same should be substantiated by the verdict of the Independent External Monitor.

3. **Duration of Holiday Listing**:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Reasons for holiday listing</th>
<th>Period of holiday listing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indulged in malpractices resulting in financial loss to the Corporation</td>
<td>15 years</td>
</tr>
<tr>
<td>2</td>
<td>Submitted fake, false or forged documents / certificates</td>
<td>3 years</td>
</tr>
<tr>
<td>3</td>
<td>has substituted materials in lieu of materials supplied by BPCL or has not returned or has unauthorized disposed off materials / documents / drawings / tools or plants or equipments supplied by BPCL</td>
<td>15 years</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Has deliberately violated and circumvented the provisions of labour laws/ regulations / rules, safety norms, environmental norms or other statutory requirements</td>
<td>3 years</td>
</tr>
<tr>
<td>5</td>
<td>has deliberately indulged in construction and erection of defective works or supply of defective materials</td>
<td>3 years</td>
</tr>
<tr>
<td>6</td>
<td>has not cleared BPCL's previous dues if applicable</td>
<td>1 year</td>
</tr>
<tr>
<td>7</td>
<td>has committed breach of contract or has abandoned the contract</td>
<td>3 years</td>
</tr>
<tr>
<td>8</td>
<td>Poor performance of the Agency in one or several contracts</td>
<td>1 year</td>
</tr>
<tr>
<td>9</td>
<td>has not honoured the fax of award / letter of award / Contract / Purchase order after the same is issued by BPCL</td>
<td>1 year</td>
</tr>
<tr>
<td>10</td>
<td>Withdraws/ revises the bid upwards after becoming the L1 bidder</td>
<td>1 year</td>
</tr>
<tr>
<td>11</td>
<td>has parted with, leaked or provided confidential / proprietary information of BPCL to any third party without the prior consent of BPCL</td>
<td>15 years</td>
</tr>
<tr>
<td>12</td>
<td>If the Agency is or has become bankrupt, OR is being dissolved OR has resolved to be wound up OR if proceedings for winding up or dissolution has been instituted against the Agency</td>
<td>3 years</td>
</tr>
<tr>
<td>13</td>
<td>Transgression of Integrity Pact, which, in the opinion of the Corporation, makes it undesirable to deal with the Agency;</td>
<td>3 years</td>
</tr>
</tbody>
</table>

3.1 In cases where Holiday Listing is proposed based on advice from the Administrative Ministry, no show cause or formal decision by competent authority will be required. The Nodal Department will directly intimate the Agency that they have been placed in Holiday Listing by BPCL based on the Ministry’s advice.

4. **Provision for Appeal:**

4.1 An agency aggrieved with the decision of the Competent Authority shall have the option of filing an appeal against the decision of the Competent Authority within a maximum of 15 days from the date of receipt of intimation of holiday listing.

4.2 Any appeal filed after expiry of the above period shall not be considered by the Appellate Authority;
4.3 On receipt of the Appeal from the Agency, the Appellate Authority, if it so desires, may call for comments from the Competent Authority;

4.4 After receipt of the comments from the Competent Authority, the Appellate Authority, if it so desires, may also given an opportunity for personal hearing, to the Appellant Agency;

4.5 After examining the facts of the case and documents available on record and considering the submissions of the Appellant Agency, the Appellate Authority may pass appropriate order by which the Appellate Authority may either:

a) Uphold the decision of Competent authority with or without any variation /lesser period of Holiday Listing; OR
b) Annul the order of the Competent Authority.

4.6 No Appeal is permitted in case an Agency is placed in Holiday List by BPCL, based on Ministry’s advice

5. **Effect of Holiday Listing**

5.1. No enquiry / bid / tender shall be entertained with an Agency as long as the ‘Agency’ name appears in the Holiday list.

5.2. If an ‘Agency’ is put on the Holiday list during tendering:

a) If an ‘Agency’ is put on Holiday List after issue of the enquiry / bid / tender but before opening of the un-priced bid, the un-priced bid of the ‘Agency’ shall not be opened and BG/EMD, if submitted by the ‘Agency’ shall be returned. If an ‘Agency’ is put on Holiday List after un-priced bid opening but before price bid opening, the price bid of the ‘Agency’ shall not be opened and BG/EMD submitted by the ‘Agency’ shall be returned.

b) If an ‘Agency’ is put on Holiday List after opening of price bid but before finalization of the tender, the offer of the ‘Agency’ shall be ignored and will not be further evaluated and the BG/EMD if any submitted by the ‘Agency’ shall be returned. The ‘Agency’ will not be considered for issue of order even if the ‘Agency’ is the lowest (L1). In such situation next lowest shall be considered as L1;

c) If contract with the ‘Agency’ concerned is in operation, (including cases were contract has already been awarded before decision of holiday listing) normally order for Holiday Listing from business dealings cannot affect the contract, because contract is a legal document and unless the same is terminated in terms of the contract, unilateral termination will amount to breach and will have civil consequences.

***************
BHARAT PEROLEUM CORPORATION LIMITED

INTEGRITY PACT

Between

Bharat Petroleum Corporation Limited (BPCL) hereinafter referred to as "The Principal",

And

.................................................. hereinafter referred to as "The Bidder/Contractor/Supplier"

Preamble

The Principal intends to award, under laid down organization procedures, contract/s for ...........................................The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidders, Contractor/s and Supplier/s.

In order to achieve these goals, the Principal cooperates with the renowned International Non-Governmental Organisation "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an Independent External Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 - Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a) No employee of the Principal, personally or through family members, will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for himself/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

b) The Principal will, during the tender process, treat all Bidders with equity and reason. The Principal will, in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential / additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

c) The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder / Contractor/Supplier

(1) The Bidder / Contractor/Supplier commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a) The Bidder / Contractor/Supplier will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person, any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange, any advantage of any kind whatsoever during the tender process or during the execution of the contract.
b) The Bidder / Contractor/Supplier will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

c) The Bidder / Contractor/Supplier will not commit any offence under the relevant Anti-Corruption Laws of India; further the Bidder / Contractor/Supplier will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder / Contractor/Supplier will, when presenting his bid, disclose any and all payments he has made, is committed to, or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder / Contractor/Supplier will not instigate third persons to commit offences outlined above or be an accessory to such offences.

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

If the Bidder, before contract award, has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

(1) If the Bidder/Contractor/Supplier has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is also entitled to exclude the Bidder / Contractor/Supplier from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

(2) A transgression is considered to have occurred if the Principal after due consideration of the available evidences, concludes that no reasonable doubt is possible.

(3) The Bidder accepts and undertakes to respect and uphold the Principal’s absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

(4) If the Bidder / Contractor/Supplier can prove that he has restored / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

Section 4 - Compensation for Damages

(1) If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit/Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor/Supplier liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

(3) The Bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder / Contractor/Supplier can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount of the liquidated damages, the Bidder /
Contractor/Supplier shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 - Previous Transgression

(1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

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

(1) The Bidder/Contractor/Supplier undertakes to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors/Suppliers and Subcontractors.

(3) The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Section 7 – Punitive Action against violating Bidders / Contractors / Suppliers/Subcontractors

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

Section 8 - Independent External Monitors

(1) The Principal has appointed competent and credible Independent External Monitors for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

(3) The Bidder/Contractor/Supplier accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Bidder/Contractor/Supplier. The Bidder/Contractor/Supplier will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Supplier/Subcontractor with confidentiality.

(4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project; provided such meetings could have an impact on the contractual relations between the Principal and the Bidder/Contractor/Supplier. The parties offer to the Monitor the option to participate in such meetings.

(5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The Monitor can in this regard submit a binding recommendation. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the Bidder/Contractor/Supplier to present its case before making its recommendations to the Principal.
(6) The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the ‘Principal’ and, should the occasion arise, submit proposals for correcting problematic situations.

(7) If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

(8) The word ‘Monitor’ would include both singular and plural.

Section 9 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor/Supplier 12 months after the last payment under the respective contract, and for all other Bidders 8 months after the contract has been awarded.

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

Section 10 - Other provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Mumbai. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Bidder/Contractor/Supplier is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

(4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

For the Principal

[Signature]

Place: MUMBAI

For the Bidder/Contractor/Supplier

[Signature]

Witness 1: [Signature/Name/Address]

Witness 2: [Signature/Name/Address]
1) Proforma of Integrity Pact (IP) shall be uploaded by the Bidder/s along with the unpriced bid documents duly signed (or digitally signed in case of e-tender) by the same signatory who is authorized to sign the bid documents. All the pages of the Integrity Pact shall be duly signed. Bidder's failure to upload the IP duly signed (Digitally) along with bid documents shall result in the bid not being considered for further evaluation.

2) If the Bidder has been disqualified from the tender process prior to the award of the contract in accordance with the provisions of the IP, BPCL shall be entitled to demand & recovered from Bidder Liquidated Damages amount by forfeiting the EMD/Bid Security as per provisions of IP.

3) If the contract has been terminated according to the provisions of the IP, or if BPCL is entitled to terminate the contract according to the provisions of the IP, BPCL shall be entitled to demand & recovered from Contractor Liquidated Damages amount by forfeiting the Security Deposit/Performance Bank Guarantee as per provisions of the IP.

4) Bidders may raise disputes/complaints, if any, with the nominated Independent External Monitor (IEM). The IEM's name, address & contact number is given below:

Shri Brahman Dutt
A-1/8 Safdarjung Enclave
New-Delhi
110029
Mob: 0 98719 20282
e-mail: ID: dutt.brahm@gmail.com
Quality, Environment, Health and Safety QEHS Policy

We at BPCL Mumbai Refinery, commit to consistently provide products & services that meet total customer satisfaction by demonstrating excellence in our Quality, Environment, Occupational Health & Safety (QEHS) performance surpassing our stakeholders’ expectations.

To achieve the above, we do and will continue to:
- Recognize QEHS management as our core responsibility
- Comply with all applicable legislations and other requirements
- Drive continual improvement of all our processes

We shall communicate the QEHS Policy to public, our vendor community and all persons working for and on behalf of Mumbai Refinery to encourage their participation in this endeavour.

SS Sunderajan
General Manager I/C
Mumbai Refinery
Energy Policy

We at BPCL Mumbai Refinery, are committed to continual improvement in Refinery Energy Performance and shall demonstrate Excellence in Energy Management System by:

- Complying with all applicable legal and other requirements.
- Ensuring availability of information & resources to achieve objectives and targets which will be reviewed periodically.
- Supporting purchase of Energy Efficient products and services, incorporating latest design for Energy Performance Improvement.

SS Sunderajan
General Manager I/C
Mumbai Refinery
Item wise bifurcation of payment schedule
S.No.

Particulars

Upto
Plinth

G.F.

%

%

1st
floor

2nd
floor

3rd
floor

4th
floor

5th
floor

6th
floor

7th
floor

8th
floor

9th
floor

10th
floor

11th
floor

12th
floor

13th
floor

14th
floor

15th
floor

16th
floor

17th
floor

18th
floor

Terrace Infra
floor & Struct
above
ure

Total % age
after breakup

%

1

Site Preparation, Excavation, Backfilling, Compaction,
Anti-termite Treatment etc. complete till plinth level.
Payment shall be released as below-

1.60

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

1.60

a

Preparation of site by Barricading, leveling and cutting, filling,
Vegetation clearing, top soil preservation etc. complete.
Excavation for foundation including cutting, shifting of
excavated material if necessary, soling, PCC for foundation,
anti-termite treatment for foundation

0.80

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

0.80

b

Back Filling, compaction between footing, column, plinth
beam, and compaction in plinth, etc., and Antitermite
treatment at plinth level and periphery of the buildings i.e. all
work up to Plinth level etc. complete.

0.80

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

0.80

2

RCC Works for Substructure and Superstructure.
Payment shall be released as below-

2.40

1.70

1.70

1.70

1.70

1.70

1.70

1.70

1.70

1.75

1.70

1.75

1.70

1.75

1.70

1.75

1.70

1.75

1.70

1.70

0.40

-

35.35

a

R.C.C. work for foundations,columns, beams, slabs, lintels,
pardi, chajja, landings, parapet and waist slabs of staircase
including steel including OH & UG Tank etc. complete.

2.40

1.70

1.60

1.70

1.70

1.60

1.70

1.70

1.60

1.75

1.70

1.65

1.70

1.75

1.60

1.75

1.70

1.65

1.70

1.70

0.40

b

Misc RCC Works for lofts, staircase pardi, RCC Jali etc.

-

-

3

Masonary Works

-

0.05

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

4

Door and window shutters with frame, M.S. grill and
related hardware fittings works etc. complete. Payment
shall be released as below-

-

0.10

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

0.40

a

Fixing of Door and window frames ( 20 % )

-

0.02

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

b

Fixing of windows including hardwares fittings etc. complete
(40 % )

-

0.04

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

0.16

c

Fixing of MS grills ( 20 % )

-

0.02

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

d

Fixing of Door shutters with hardwares (20 % )

-

0.02

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

0.08

5

Internal & External plaster etc. complete. Payment shall
be released as below-

-

0.05

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.03

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.10

0.10

0.10

0.10

0.10

0.10

34.75

-

-

0.60

0.20

0.05

-

3.70

0.40

0.40

0.10

-

7.40

0.08

0.08

0.08

0.02

-

1.48

0.16

0.16

0.16

0.16

0.04

-

2.96

0.08

0.08

0.08

0.08

0.08

0.02

-

1.48

0.08

0.08

0.08

0.08

0.08

0.08

0.02

-

1.48

0.20

0.20

0.20

0.20

0.20

0.20

0.20

0.10

-

3.75

0.12

0.12

0.12

0.12

0.12

0.12

0.12

0.06

a

Internal Plaster (60%)

-

-

2.25

b

External Plaster 50% ot total area covarage (20%)

-

0.75

-

0.75

c

External Plaster remaining 50% ot total area covarage (20%)

-

0.75

-

0.75

6

Waterproofing of terrace, W.C., bath, chajja, staircase
roof cabin, refuge areas, balconies, UG tank, OH tank, lift
pit & machine room etc. complete. Payment shall be
released as below-

-

0.02

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.04

0.55

-

1.29

a

Waterproofing of UG tank, lift pit etc. complete (10%)

-

0.002

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.004

0.055

-

0.13

b

Waterproofing of W.C., bath, chajja, refuge areas, balconies,
etc. complete. (60%)

-

0.01

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.02

0.33

-

0.77

c

Waterproofing of terrace, OH tank, lift machine room (30%)

-

0.006

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.012

0.165

-

0.39

-

0.30

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.70

0.20

-

13.10

-

0.09

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.21

0.06

-

3.93

7
a

Flooring in all rooms, entrance and passage, bath,
staircase, dado, skirting, kitch otta etc. Carpentary Works
Cupboards / wardrobes, kitchen shutters and storage
units etc. complete.
Flooring & skirting in all rooms ( 30 % )


### 8 Internal and external painting etc. complete.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Painting (40%)</td>
<td>0.02</td>
<td>0.20</td>
<td>0.04</td>
</tr>
<tr>
<td>External Painting (60%)</td>
<td>0.01</td>
<td>0.12</td>
<td>0.01</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>0.05</td>
</tr>
</tbody>
</table>

### 9 GRC Grill work and Misc. Work

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRC Grill work 50% of total area coverage</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>GRC Grill works remaining 50% of total area coverage</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>0.12</td>
</tr>
</tbody>
</table>

### 10 Internal electrification with service connection, fixtures etc. complete.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying of conduits and junction box in slab (10%)</td>
<td>0.02</td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>Laying of conduits and switch boards, DD boards and cabling through duct (15%)</td>
<td>0.02</td>
<td>0.14</td>
<td>0.28</td>
</tr>
<tr>
<td>Internal wiring and completion of switch boards with switches and sockets etc. (40%)</td>
<td>0.06</td>
<td>0.10</td>
<td>0.60</td>
</tr>
<tr>
<td>Fixing all fixtures such lights, fans etc (35%)</td>
<td>0.05</td>
<td>0.09</td>
<td>0.45</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>1.75</td>
</tr>
</tbody>
</table>

### 11 Internal plumbing works including water supply, drainage, water supply and sanitary fittings like W.C. pans, wash hand basin etc. complete.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal piping for water supply and drainage, floor trap, and Testing of water supply and sewerage system (60%)</td>
<td>0.15</td>
<td>0.21</td>
<td>0.32</td>
</tr>
<tr>
<td>Fixing of all fixtures such as bib cocks, mixers showers with all fittings &amp; Testing of all fittings complete (40%)</td>
<td>0.10</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>0.46</td>
</tr>
</tbody>
</table>

### 12 External water supply including external drainage and sewerage work etc. complete.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>External electrification and distribution system including installation and commissioning etc. complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Fighting System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Works- Building surrounding Soling, Part PCC, Paver Block works etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Delivery (60%)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Installation (40%)</td>
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<tr>
<td>Payment shall be released on completion of project in all respect, including submission of Royalty Clearance Certificate, a necessary certificate from electrical inspector lifts, Occupancy Certificate including P form, C form and physical Water Connection, Submission of services as built Drawings, Successful handing over, site clearance, conveyance of excess excavated debris material at any lead etc. complete.</td>
<td></td>
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</tr>
<tr>
<td>Griha norms, and all other Compliance of Green building</td>
<td></td>
<td></td>
<td>1.90</td>
</tr>
</tbody>
</table>

RA Bill wise payment as per actual work done under item 1 to 18 Say (X). Payable amount per bill = X % of 1.90 i.e. Y %