



**TENDER DOCUMENT
(e-Procurement)**

Tender No: IISc/Tender-Fire_Lab-01/2023-24

For

Fire Structural Testing Facility at
Indian Institute of Science,
Challakere campus at Khudapura,
Challakere, Chitradurga District,
Karnataka - 577 536

Chairman, Department of Civil Engineering, Indian Institute of Science
Bangalore 560 012. 080 2293 2324

Website : <https://eprocure.gov.in/eprocure/app>

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1. Tender Notification

Tender No: IISc/Tender-Fire_Lab-01/2023-24

Name of work	Fire Structural Testing Facility at Indian Institute of Science, Challakere campus at Khudapura, Challakere, Chitradurga District, Karnataka - 577 536
Estimated Value of work	Rs. 32696923
Period of Work Completion	150 days with priority on furnace building and control cabin room within 60 days to be ready for third party commissioning of required facilities for testing
Name of the Client	Indian Institute of Science, Bangalore
Address of the Client	Chair, Department of Civil Engineering Indian Institute of Science Bangalore - 560 012 Tel No. 080-2293 2008/2202 e-mail: chair.civil@iisc.ac.in
Tender Fee	As per e-procurement portal
Submission of Tender Document	e-procurement portal- https://eprocure.gov.in/eprocure/app Helpline no: 0120-4001005
Earnest Money to be deposited with the Tender	Rs. 490454.00 (1.5% of the Estimated Cost)
Last date and Time for online submission (uploading) of tender	21 st December 2023 at 1530Hrs
Date and Time of opening of Tender (Technical Bid)	22 nd December 2023 at 1530Hrs
Date and Time of opening of Tender (Financial Bid)	Shall be intimated to technically qualified bidders thro' CPP portal.

Pre-bid meeting Date, Time & Venue	13 th December 2023 at 11.30 am Prebid meeting will be held on Teams App. The web link will be forwarded to the intending bidders. They are requested to send the request to the email id: chair.civil@iisc.ac.in Queries can be mailed in prior to the same mail.
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Notice Inviting Tender

The Chairman, Department of Civil Engineering, Indian Institute of Science invites tenders in two bids (Technical and Financial) system from eligible Bidders, for **the Fire Structural Testing Facility at**
Indian Institute of Science,
Challakere campus at Khudapura,
Challakere, Chitradurga District,
Karnataka - 577 536
Location map in item 15

Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Government of India or any State Government of Union of India. (Authorized signatory should provide an undertaking). Tenders from Joint ventures are not acceptable.

The Bidder should belong to either class 1 or class 2 supplier distinguished by their "local content" as defined by recent edits to GFR (please refer to annexure (item 16) attached). They should mention clearly which class they belong to in the cover letter. a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%. b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%. c) Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition. 3. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to Class-1 supplier.

- 2.1 All Bidders shall provide the required information accurately and enough as per details in Section 4: Eligibility Criteria
- 2.2 The Tenderer shall upload the valid certificate copies of the documents as mentioned in the Chapter-4 (Eligibility criteria) in technical bid, **failing which the tender will be rejected.** If necessary, bidder shall produce all the original documents for verification.
- 2.3 The work shall be carried out as per the directions of the **Chairman, Department of Civil Engineering, IISc.**
- 2.4 Blacklisted contractors in State / Central Govt. Departments / BBMP / PSU/ Central PSUs/ Autonomous bodies / Institutions are not eligible to quote, if found such tenders will be rejected. The contractors who are penalized due to delay in completion of the previous works will be rejected.
- 2.5 The successful Bidder shall execute an Agreement within 10 days from the date of Receipt of intimation from this office, The Tender Document will form the part and parcel of the agreement, failing which the tender will deem to be get cancelled.
- 2.6 The material shall be got approved by the **Chairman, Department of Civil Engineering, IISc** before execution of the work.
- 2.7 Further details of the work can be obtained from this office.
- 2.8 The rates quoted should reflect all taxes. The bid evaluation will be done inclusive of all Taxes / Cess. / Royalty etc. The statutory levies as per Govt. guidelines will be deducted. The IISc reserves the right to accept / reject any or all the tenders without assigning any reasons.
- 2.9 The work shall be commenced with all men and machinery within 10 days from the date of work order, failing which it would be presumed that the successful tenderer is not interested in the work and action will be taken to get the work executed through alternate agency at the risk and cost of the former Tenderer.
- 2.10 Conditional tenders will not be accepted and is liable for rejection.

- 2.11 Bidders, who meet the above specified minimum qualifying criteria, shall be eligible.
- 2.12 Even though the Bidders meet the above criteria, they are subject to be disqualified if they have:
- Made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
 - Record of poor performance such as abandoning the works, not properly completed the contract, inordinate delays in completion, litigation history, or financial failures etc.

2.15 Site visit:

The Bidder at his own responsibility is encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for the Works. The cost of visiting the Site shall be at the Bidder's own expense.

- 2.16 The Tender document can be downloaded from e-procurement website: <https://eprocure.gov.in/eprocure/app>. It may be noted that all subsequent notifications, changes and amendments on the project/document would be posted only on the same website. The bidders are advised to visit e-procurement portal and get familiarized with the procedure for submission of the tenders.

2.17 Content of Tender documents

The bidders should go through the Tender Document and submit online response through e-procurement portal only.

2.18 Amendment of Tender documents

Before the deadline for submission of tenders, the IISc may modify the tender documents by issuing corrigendum / addendum.

Such corrigendum/ addendum thus issued shall be part of the tender documents and shall be published online in e-Procurement portal.

To give prospective Bidders reasonable time in which to take corrigendum/ addendum into account in preparing.

2.19 Documents comprising the Tender

The Technical Bid submitted by the Bidder shall contain the documents as follows:

- a) Earnest Money Deposit & Tender fee paid in the specified form as mentioned in the e-Procurement platform.
- b) Qualification Information as per formats to comply the task created in the e-Procurement Portal under General Terms and Conditions and Technical parameters and Documents required from Bidder.
- c) Any other documents / materials required to be completed and submitted by Bidders in accordance with these instructions. The required documents shall be filled in without exception.

The bidder shall submit the hard copies of the documents / credentials which are uploaded in the tender portal. The documents shall reach the designated office [Chairman, Department of Civil Engineering] within 3 days from the tender opening date.

The Financial bid shall be submitted by the bidder through e-procurement portal only and no hard copy of financial bid should be attached or disclosed.

The contract shall be for category of works / whole works based on the priced Bill of Quantities submitted by the Bidder.

All prevailing duties, taxes, and other levies like CESS/Royalty payable by the contractor under the contract, or for any other cause, shall be included in the rates, prices and total Tender Price submitted by the Bidder.

2.20 Tender validity

Tenders shall remain valid for a period not less than **180 days** after the deadline date for tender submission. A tender valid for a shorter period shall be rejected by the IISc as non-responsive.

In exceptional circumstances, prior to expiry of the original time limit, the IISc. may request that the Bidders may extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing or by email. A Bidder may refuse the request without forfeiting his earnest money deposit. A Bidder agreeing to the request will not be required or permitted to modify his tender but will be required to extend the validity of his earnest money deposit for a period of the extension, and in compliance with Clause 2.18 and 2.22 in all respects.

2.21 Earnest money deposit and Tender fee:

The Bidder shall furnish, as part of his tender, earnest money deposit (EMD) and tender fee. The Bidder has to pay the Earnest Money Deposit (EMD) and Tender fee in the form of Demand draft drawn on "The Registrar, IISc" payable at "Bangalore".

The bidder has to scan the demand draft and submit it with Technical Bid Documents for our reference. The original DDs has to be submitted along with the hard copies of all the documents in a sealed cover as a pre-qualification bid (Technical bid) which were uploaded through e-procurement portal.

The EMD amount and tender fee will have to be submitted by the bidder taking into account the following conditions:

- a) The entire amount must be paid in a single transaction.
- b) The earnest money deposit of unsuccessful Bidders will be returned after awarding the contract to the successful bidder.

The earnest money deposit may be forfeited:

- a) If the Bidder withdraws the tender after tender opening during the period of tender validity,
- b) If the Bidder fails within the specified time limit to
 - i) Sign the Agreement; or
 - ii) Furnish the required Security deposit

2.22 Provisions for Micro, Small and Medium Enterprises (MSME):

The MSME registered bidder should upload the registration certificate in the CPP portal along with the technical bid documents. The MSME registration to specify manufacturing / service of the tender item (s).

Policy is meant for procurement of only goods produced and services rendered by MSMEs. However, traders are excluded from the purview of Public Procurement Policy.

Participating Micro and Small Enterprises quoting price within price band of L1+15%, will qualify to supply a portion of requirement by bringing down price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprises.

2.23 Format and signing of Tender

Successful Bidder shall sign all the pages of the tender document as a token of acceptance of all the terms and conditions of the contract.

2.24 Submission of Tenders

Tenders must be submitted on-line in the e-Procurement portal by the Bidder before the notified date and time.

2.25 Deadline for submission of the Tenders

The Bidder shall submit a set of hard copies of all the documents in a sealed cover to IISc required as a pre-qualification bid (Technical bid) which were uploaded through e-

procurement portal. In the event of any discrepancy between them, the original uploaded document in e-procurement shall govern.

The IISc may extend the deadline for submission of tenders by issuing an amendment, in which case all rights and obligations of the IISc and the Bidders previously subject to the original deadline will then be subject to the new deadline.

2.26 Late Tenders

In e-procurement system, Bidder shall not be able to submit the bid after the bid submission time and date as the icon or the task in the e-procurement portal will not be available. IISc will not be liable (or) responsible for any delay due to unavailability of the portal and the Internet link.

2.27 Modification and Withdrawal of Tenders

Bidder has all the time to modify and correct or upload any relevant document in the portal till last date and time for Bid submission, as published in the e-procurement portal.

The Bidder may withdraw his tender before the notified last date and time of tender submission. No Tender may be modified after the deadline for submission of Tenders.

Withdrawal or modification of a Tender between the deadline for submission of Tenders and the expiration of the original period of Tender validity specified in Clause 2.21 above may result in the forfeiture of the earnest money deposit.

2.28 Tender Opening:

The IISc will open all the Tenders received through online mode, in the presence of the Bidders or their representatives who choose to attend on the specified date, time and place specified. In the event of the specified date of Tender opening being declared a holiday for the IISc. The Tenders will be opened at the appointed time and location on the next working day.

The IISc will evaluate and determine whether each tender meets the minimum qualification eligibility criteria.

Bidder to submit all the Original Documents, which are submitted in e-procurement portal, to the IISc for verification at the time of opening of Tender. The IISc will record the Tender opening.

2.29 Process to be confidential

Information relating to the examination, clarification, evaluation, and comparison of Tenders and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced.

2.30 Clarification of Tenders

To assist in the examination, evaluation, the IISc may, at his discretion, ask any Bidder for clarification of his Tender. The request for clarification and the response shall be in writing or by e-mail along with the section number, page number and subject of clarification, but no change in the price or substance of the Tender shall be sought, offered, or permitted.

Subject to clause 2.31, no Bidder shall contact the IISc on any matter relating to its Tender from the time of the Tender opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the IISc, he/she should do so in writing.

Any effort by the Bidder to influence the IISc in the Tender evaluation, or contract award decisions may result in the rejection of the Bidders' Tender.

2.31 Examination of Tenders and determination of responsiveness

Prior to the detailed evaluation of Tenders, the IISc will determine whether each Tender (a) meets the eligibility criteria (b) is accompanied by the required earnest money deposit and; (c) is substantially responsive to the requirements of the Tender documents.

A substantially responsive Tender is one which conforms to all the terms, conditions, and specifications of the Tender documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the Tender documents, the IISc's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Tenders.

If a Tender is not substantially responsive, it will be rejected by the IISc., and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

2.32 Correction of errors

No corrections to uploaded bid is permitted by the portal. Tenders determined to be substantially responsive will be checked by IISc.

2.33 Evaluation and comparison of Tenders

Opening of the Financial bid will be preceded by the evaluation of the Pre-qualification Offer (Technical bid), vis-a-vis the capability, capacity and credibility of the Bidder. Evaluation of the Prequalification Offer will be done by the Evaluation Committee constituted for the purpose. After evaluation is completed, all the Bidders who are qualified will be notified and will be intimated at the time of opening of the Financial bid. Financial bid will be opened in the presence of those who choose to be present or even in the absence of any Bidder.

The IISc will evaluate and compare the Tenders as per comparative statement downloaded from e-procurement portal.

In evaluating the Tenders, the IISc. will determine for each Tender the evaluated Tender Price by adjusting the Tender Price as follows:

- a) Making any correction for errors and
- b) Making appropriate adjustments to reflect discounts or other price modifications offered

The IISc reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Tender documents or otherwise result in unsolicited benefits for the IISc shall not be taken into account in Tender evaluation.

2.34 Negotiations

The Bidder though technically qualified and whose financial offer is the lowest, fails to convince the Tender Evaluation Committee of his capability, capacity, credibility, his offer may be reviewed, and the Bidder intimated accordingly. In such case, the Bidder, who has quoted the lowest price, may be considered and his price may be negotiated as advised by the tender committee.

2.35 Award criteria

Subject to Clause 2.36, the IISc will award the Contract to the Bidder whose Tender has been determined to be substantially responsive to the Tender documents and who has offered the lowest evaluated Tender Price. After technical evaluation the technically qualified bidders will be considered for opening of the financial bids provided that such Bidder has been determined to be eligible in accordance with the provisions of this tender document and subsequent technical clarifications offered by the responsive bidders.

2.36 Right to accept any Tender and to reject any or all Tenders

Notwithstanding Clause 2.35, the IISc reserves the right to accept or reject any Tender, and to cancel the Tender process and reject all Tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the IISc's action.

2.37 Notification of award and signing of Agreement

The Bidder whose Tender has been accepted will be notified of the award by the IISc. prior to expiration of the Tender validity period by e-mail or confirmed by letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the IISc. will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

The notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance security in accordance with the provisions of clause 2.39

The Agreement will incorporate all agreements between the IISc and the successful Bidder /Bidders. It will be kept ready for signature of the successful Bidder in the office of IISc. Following the notification of award along with the Letter of intent. The successful Bidder will sign the Agreement and deliver it to the IISc.

Upon the furnishing by the successful Bidder of the Security deposit, the IISc will issue formal work order.

The successful bidder is required to sign an agreement for the due fulfilment of the contract and start the work immediately on of the acceptance of his tender. A draft of the Articles of the Agreement is enclosed. The Earnest Money will be forfeited and at the absolute disposal of the Employer if the Contractor defaults from signing the Agreement of in starting the work.

2.38 Further Security deposit (FSD)

Further percentage on the running bills and final bill in addition to Earnest Money Deposit shall be levied from the contractor. When the FSD deducted from R.A Bills of the contractor @ **6%** of the bill amount exceeds Rs.1.00 Lakh, the amount in excess of Rs. 1.00 Lakh may, at the request of the bidder, be released to him against the production of the bank guarantee issued from a Nationalized Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the defect liability period.

If the security deposit is provided by the successful bidder in the form of a Bank Guarantee, it shall be issued either by a Nationalized/Scheduled bank.

Failure of the successful Bidder to comply with the requirements of clause 2.38 shall constitute sufficient grounds for cancellation of the award and forfeiture of the earnest money deposit.

2.39 Corrupt or Fraudulent practices

The IISc requires that the Bidders observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, IISc.

- a) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.
- b) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a IISc contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a IISc contract.

2.40 Payment Terms

For Civil works: Monthly running account bills.

For Electrical works: 80% against the supply of material and 10% after installation and 10% after testing and commissioning, subject to the other provisions of the tender document.

2.41 Work done as a sub-contractor under a prime contractor will not be considered for qualification. "Prime Contractor" means a firm that performs a construction work itself and that the work is directly entrusted to the firm by the owner/ government/ local body/ quasi government/ Government undertaking bodies.

3 Declaration of Tenderer

Name of Work:
Fire Structural Testing Facility at
Indian Institute of Science,
Challakere campus at Khudapura,
Challakere, Chitradurga District,
Karnataka - 577 536

- 3.1 I/We, declare that specifications, plans, designs and conditions of contract on which the rates have been quoted are completely studied by me/us before submitting this tender.
- 3.2 I/We declare that I/We have inspected the work spot and have made myself/ourselves thoroughly conversant and satisfied as regards the field conditions prevalent there, regarding the materials, labour and the particulars of various leads with which the materials required to be brought for the work.
- 3.3 I/We, declare that the rates quoted for items of works for which now tenders are called for are inclusive of leads with which I/We propose to bring the materials. I/We will not have any claims for higher leads, and my/our quoted rates are with all leads and lifts etc.,
- 3.4 I/We, declare that the rates tendered by me/us for this work have not been witnessed by any other contractor/s who has/have tendered for this work.
- 3.5 I/We, declare that I/We, have understood all the conditions mentioned above and also the specifications stipulated in tender condition either by going through myself/ourselves or by getting translated into my/our own mother tongue.

4 Eligibility Criteria

Technical Criteria:

- 4.1– Any specialised firms company registered under KPWD /CPWD/ railways/ MES/ central PSUs/ or any Government department of class I / Class A civil contractors are eligible to apply.
- 4.2The Bidder should have Experience of having a successfully completed either of the following works:
- (a) Three (03) similar nature of completed works each costing not less than **40%** (forty percent) of the estimated cost i.e. **Rs. 13078769,00**
(Or)
 - (b) Two (02) similar nature of completed works each costing not less than **60%** (Sixty percent) of the estimated cost i.e. **Rs. 19618153.80**
(Or)
 - (c) One (01) similar nature of completed work costing not less than **80%** (eighty percent) of the estimated cost i.e. **Rs. 26157538.40**

Note: The Experience certificate / work order should be in the same registered name as per Clause 4.1 and not as a joint venture.

The works should have been completed in last seven (7) consecutive years.

The company/bidder should have ISO/ISI certification with regard to 9001, 14001 and OHSAS 18001 (SAFETY) certifications (will not be used in disqualification of an agency). As a supporting document of valid proof of registration Certificate details to be submitted. (Same as It is Applicable in Clause 9.3.a)) And all necessary certificates should be enclosed.

The bidders have to provide an undertaking on their letterhead in the format. given below.

We hereby declare that is a class1/class 2 local supplier in accordance and manner as specified in Order No. P45021/2/2017-PP (BE-II) dated : 04th June 2020 and OM No. P-45021/102/2019-BE-II-Part(1) (E-50310) dated 04.03.2021 issued by DIPP, Ministry of Commerce and Industries, Gol".

Financial Criteria

- 4.3The bidder should have registered for a minimum period of Ten years.
- 4.4The average annual financial gross turnover should be 30% of estimated cost in that last five years.
- 4.5The minimum annual financial turnover for the two consecutive years should be 30% of estimated cost.
- 4.6The bidder should have not incurred any loss in more than two years. The bidder should submit the **solvency certificate** from the bank for 30% of estimated cost. The Solvency should not be more than Six month Old. (Validity should be till completion of the Contract period)
- 4.7The average net worth of the bidder as of **2022-23** should be not less than 25% of estimated cost. Necessary certificate by the Chartered Accountant shall be submitted.
- 4.8The bidder should have not been blacklisted by any State / Central Govt. Departments / BBMP / PSU/ Central PSUs/ Autonomous bodies / Institutions.
- 4.9The bidding capacity of the bidder should be 75% or more of the estimated cost.

The bidder should possess the bidding capacity as calculated by the following formula.

Available bid capacity = A x M x N -B, where

A = Maximum value of engineering (Civil/ Electrical/ Mechanical as relevant to work being procured) works executed in any one year during the last five years (updated at the current price level), taking into account the completed as well as works in progress.

M = Multiplier Factor (usually 1.5)

N = Number of years prescribed for completion of the work in question.

B = Value (updated at the current price level) of the existing commitments and ongoing works to be completed in the next 'N' years.

4.10 Information on works for which tenders have been submitted and ongoing works as on the date of this Tender.

(A) Existing commitments and on-going works:

Description of work	Place & State	Contract number & date	Name & address of the customer	Value of Contract in Lakhs	Stipulated period of completion	Value of work remaining to be completed in Lakhs	Anticipate d date of completion
1	2	3	4	5	6	7	8

[Details to be furnished with necessary work order signed from concerned project in-charge not below the rank of Executive Engineer or Competent Authority. The Work order/Testimonials will be verified, if required]

(B) Works for which Tenders already submitted:

Description of work	Place & State	Name & address of the customer	Estimated value of work in lakhs	Stipulated period of completion	Date when decision is expected	Remark if any
1	2	3	4	5	6	7

4.11 Certificate from Chartered Account stating turn over for the last five years is also to be uploaded.

Sl.No	Year	Turn over amount	Remark
1	2018-19		
2	2019-20		
3	2020-21		
4	2021-22		
5	2022-23		

Litigation and Arbitral Issues:

4.12 Net pending litigations should not be more than 50% of bidder's net worth. As a supporting document of undertaking letter to be submitted by Bidder. It must be certified by Authorized Legal person / lawyer.

4.13 No consistent history of court/arbitral award decisions against the bidder for the last five years. As a supporting document of under letter to be submitted by Bidder. It must be confirmed by Authorized Legal person / lawyer.

5 Special Conditions

- 5.1.1 Establishment of Labor Camp is strictly prohibited in the premises of Indian Institute of Science Campus. Essential labor for round the clock work at site will be allowed with prior permission of **Chairman, Department of Civil Engineering**.
- 5.1.2 Any damage to the existing service lines during execution of work shall be got rectified by the bidder at his own cost and risk.
- 5.1.3 Debris shall be disposed-off to the nearest undisputed place as per the direction of the Engineer-in-Charge, whenever required.
- 5.1.4 Labor employed at the site will not be allowed to use cellphone while working at the site.
- 5.1.5 Supply of Electricity: - Electricity required for construction shall be arranged by the contractor himself. Electricity if supplied to the contractor by the Institute will be metered and amount will be recovered in the Bills as per actual at rates fixed by the Institute. Supply of electricity from the Institute is not mandatory. Non-supply of electricity by the Institute cannot be held as reason for shortfall in progress.
- 5.1.6 Water supply: The Contractor has to make his own arrangement for water supply. However, if water supply to the site at one convenient point is made available by the Institute, the charges for the consumption of water will be borne by the Contractor at 1.50% of the value of the work.
- 5.2 Schedule of Quantities (Bill of Quantities) is attached herewith. It should, however, be clearly understood that these quantities are liable to alterations by omission, addition or variation, at the discretion of the Architects/ **Chairman, Department of Civil Engineering**.
- 5.3 The drawings together with specifications and conditions of contract are enclosed. These should be studied carefully by the intending tenderers. In the absence of specifications for any item of work, material or ingredient in the specifications, CPWD/PWD specifications shall be followed and in the absence of specification for any item, materials are ingredient shall be fixed in all respects in accordance with the instructions and requirements of the **Chairman, Department of Civil Engineering**, the work will be the best of the kind.
- 5.4 The tenderer is expected to inspect the site and acquaint himself with the local conditions and will be deemed to have so done before submitting the tender.
- 5.5 The rates quoted shall be for finished work and shall include for all necessary incidental work. Sales or any other tax on materials in respect of this contract will be payable by the Contractor. The Contractors cannot presume any details regarding the contract.
- 5.6 It is entirely the responsibility of the Contractor to arrange for and provide all materials required for successful completion of the work except such special materials that may be supplied if any.
- 5.7 Tenders determined to be substantially responsive will be checked by IISc for any arithmetic errors. Errors will be corrected by the Employer as follows.
- 5.8 Where there is discrepancy between the rates in figures and in words, the lower of the two will be governed.
- 5.9 Where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will be governed.
- 5.10 Where there is a discrepancy in entries of unit rate between the Original and Duplicate, the lower will govern.
- 5.11 The Contractor should make his own arrangements to cover the all-round construction area, by providing polyester net/polythene sheet/barricading to avoid inconvenience to other surrounding departments, as directed by the **Chairman, Department of Civil Engineering, IISc**.

- 5.12 The debris arise during the period of construction will have to be cleared then and there to keep the surroundings clean and tidy. Such debris shall, if not cleared, be cleared at contractor's risk and cost.
- 5.13 The contractor shall vacate the campus premises with all his men/ materials immediately after completion of the project.

6 GENERAL CONDITIONS

6.1 DEFINITIONS OF TERMS

In constituting these conditions and specifications, the following expressions shall have the meaning, therein assigned to them unless there is something repugnant in the subject of context in consisting with such meanings.

6.2 Institute shall mean the “Indian Institute of Science, Bangalore”.

6.3 “Office” shall refer to the Office of the **Chairman, Department of Civil Engineering, IISc**.

6.4 “Contractors” shall mean the tenderer whether a firm, registered company, partnership or any individual whose tender has been accepted by Institute or by an Officer (duly authorized in this behalf) on behalf of the Institute and who has entered into agreement with Institute for due fulfillment of the contract and shall include the legal representatives, successors, heirs and assignees of the tenderer.

6.5 “Engineer” shall mean the “**Chairman, Department of Civil Engineering**”, Indian Institute of Science, Bangalore or such other officer as may be appointed to call as the **Chairman, Department of Civil Engineering** for the purpose of the contract and shall also mean and include other officers of equivalent rank directly in charge of the work or any part thereof under administrative control of the Director, IISc, Bangalore-12.

6.6 When the Engineer is named as final authority, it includes all the above-mentioned officers and, in such matters, the contractors shall have the right of appeal against the orders up to the Director, IISc, Bangalore, whose decision shall be final and legally binding on all the parties concerned.

6.7 The **Chairman, Department of Civil Engineering** named as final authority for any decision taken, shall mean only the Director, IISc, Bangalore or his duly authorized assistant.

6.8 The Engineer in charge shall mean the **Chairman, Department of Civil Engineering** directly in charge of the work or his duly authorized assistants.

6.9 Plant shall mean and include any or all plants, machinery, tools and other implements of all description necessary for the execution of the work in a safe and workmen like manner.

6.10 The expression “Works” where used in these conditions shall unless thereby something in the subject or contract repayment to such construction, be construed to mean the work or the works constructed to be executed under or virtue of the contract whether temporary or permanent and whether original, altered, substituted or additional.

6.11 “Contract and contract document” shall mean and include the notice inviting tenders, proceedings of the pre bid meeting, the stamped agreement, conditions of contract, specifications and Schedules ‘B’, drawings and all other connected documents with tender schedule.

6.12 “Specifications” shall mean the specifications annexed and where these are not specifically mentioned shall be as may be detailed and necessary due to particular nature of work as approved by the **Chairman, Department of Civil Engineering**.

- 6.13 "Site" shall mean and include all the area in which operations in respect of the work are carried out. This shall also include materials stacking yards and the area where temporary structures are put up for installing any machinery etc.
- 6.14 "Tests" shall mean such tests as are required to be carried out either by the contractor or by the **Chairman, Department of Civil Engineering** from time to time on completion as detailed in the specifications before the work is certified as being satisfactory and is taken over by the **Chairman, Department of Civil Engineering**.
- 6.15 "Month" shall mean a Calendar month.
- 6.16 "Prime contractor" means a firm that performs construction work itself and that the work is directly entrusted to the firm by the owner / Government / local body / Quasi Government / Government undertaking. Words used in singular shall also include the plural & vice-versa where the context so demands.

6.17 CONTRACTOR TO INSPECT SITE:

The contractor shall visit and examine the construction site and satisfy himself as to the nature of the existing roads or other means of communications, the character of the soil for the excavations, the extent and magnitude of the work and facilities for obtaining materials and shall obtain generally his own information on all matters affecting the execution of the work. No extra for charges made in consequence of any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description will be allowed. All expenses incurred by the contractor in connection with obtaining information for submitting this tender including his visits to the site or efforts in compiling the tender shall be borne by the Tenderer and no claims for reimbursement thereof shall be entertained.

6.18 ACCESS TO SITE:

The Contractor is to include in his rates for forming access to the site, with all temporary roads and gangways required for the works.

6.19 SETTING OUT:

The Contractor shall set out the building in accordance with the plans. All grid/center lines shall be pegged out to the satisfaction of the Engineer. The Contractor shall be responsible for the correctness of the lining out and any inaccuracies are to be rectified at his own expense. He will be responsible for taking ground levels of the site before setting out and recording them without any extra charge.

The Contractor shall construct and maintain proper benchmark at the intersection of all main walls, columns, etc., in order that the lines and levels may be accurately checked at all times.

6.20 TREASURE TROVE:

Should any treasure, fossils, minerals, or works of art of antique interest be found during excavation or while carrying out the works, the Contractor shall give immediate notice to the Engineer of any such discovery and shall make over such finds to the Institute.

6.21 ACCESS FOR INSPECTION:

The Contractor is to provide at all times during the progress of the works and the maintenance period proper means of access, with ladders, gangways etc., and the necessary attendants to move and adapt as directed for the inspection of measurement of the works by the Engineer or their representatives.

6.22 ATTENDANCE UPON ALL TRADERS:

The Contractor shall be required to permit tradesmen/ Specialized agencies appointed by the employer to execute works like water supply, Sanitary, Electrical installation, lifts, air conditioning, hardware and other specialized works. The contractor shall also permit the above mentioned agencies to use his scaffolding and retain the scaffolding till such works are completed. The rates quoted by the contractor shall be inclusive of the above facility.

6.23 GATEKEEPER AND WATCHMAN:

The Contractor from the time of being placed in possession of the site must make arrangements for watching, lighting and protecting the work, all materials, workmen and the public by round the clock on all days including Sundays and holidays at his own risk and cost.

6.24 STORAGE OF MATERIALS:

The Contractor shall provide for necessary sheds of adequate dimension for storage and protection of materials like cement, steel, lime, timber and such other materials including tools and equipment which are likely to deteriorate by the action of sun, wind, rain or other natural causes due to exposure in the open. The cement storage site shall be leak proof and shall hold at least 4 months requirement. All such sheds shall be cleared away and the whole area left in good order on completion of the contract to the satisfaction of the Engineer.

All materials which are stored on the site such as bricks, aggregates etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials.

6.25 COST OF TRANSPORTING:

The Contractor shall allow in his cost for all transporting, unloading, stacking and storing of supplies of goods and materials for this work on the site and in the places approved from time to time by the Engineer. The Contractor shall allow in his price for transport of all materials controlled or otherwise to the site.

6.26 W.C. AND SANITARY ACCOMMODATION AND OFFICE ACCESSORIES AND ACCOMMODATION:

The contractor shall provide at his own cost and expense adequate closet and sanitary accommodation complying in every respect to the rules and regulations in force of the local authorities and other public bodies, for his workmen, for the workmen of nominated sub-contractors and other contractors / specified agencies working in the building, the Chairman, Department of Civil Engineering, IISc, and other Institute agents connected with this building project and maintain the same in good working order.

The Contractor shall also provide at his own expense adequate office accommodation for the Chairman, Department of Civil Engineering, IISc preferably contiguous to his office and shall maintain the same in a satisfactory condition and shall provide light, fan and attendant etc., for the same and shall remove them after completion of the works. He shall arrange to provide latest survey Instruments and at all times maintain the same in good working order at site, to enable the Chairman, Department of Civil Engineering, IISc or other representative of Institute to check the lines and levels of the work.

6.27 MATERIALS:

Materials shall be of approved quality and the best of their kind available and shall conform to I.S. specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of

requirement for use in the work. The work-involved calls for high standard of workmanship combined with speed and to the entire satisfaction of the Chairman, Department of Civil Engineering, IISc.

6.28 TO ASCERTAIN FROM CONTRACTORS FOR THE OTHER TRADES.

The Contractor shall ascertain from all agencies / Sub-contractors all particulars relating to their work with regard to the order of its execution and the position in which chases, holes and similar items will be required; before the work is taken in hand as no patch works shall be allowed for cutting away work already executed in consequence of any neglect to ascertain these particulars beforehand.

6.29 SAMPLE APPROVAL:

Before ordering materials, the Contractor shall get the samples approved from the **Chairman, Department of Civil Engineering** well in time.

6.30 TESTING OF WORK AND MATERIAL:

The Contractor shall, if required by the Engineer arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and efficiency. If after any such test the work or portion of works is found in the opinion of the Engineer to be defective or unsound, the Contractor shall pull down and redo the same at his own cost. Defective materials shall immediately be removed from the site at his own cost.

6.31 FOREMAN AND TRADESMEN:

All Tradesmen shall be experienced men properly equipped with suitable tools for carrying out the work of carpentry and joinery and other specialist trades in a first-class manner and where the Engineer deem necessary, the Contractor shall provide such tools which are considered necessary for carrying out of the work in a proper manner.

All such tradesmen shall work under an experienced and properly trained Foreman, who shall be capable of reading and understanding all drawings, pertaining to this work and the contractor shall also comply with other conditions set out in different clauses of the conditions of the contract.

6.32 PROJECT PROGRAMME OF WORKS AND WEEKLY PROGRESS REPORT:

a) Organization chart:

The contractor should submit the proposed organization chart for the project including the details of staff to be deployed full time on site to the approval of Chairman, Department of Civil Engineering, IISc, where the Chairman, Department of Civil Engineering, IISc raises any objection to either the qualification or experience or required professionalism of any of the staff deployed by the contractor, the same shall be replaced by suitably competent person to the approval of Chairman, Department of Civil Engineering, IISc within 7 days.

b) Program chart:

The Contractor shall furnish the detailed programme of execution for timely completion of the project (inclusive of rainy season). Such a detailed program of works prepared using Industry Standard Scheduling Software like MS Project 2000 or Primavera shall be submitted by the Contractor within ten days after receiving communication of tender acceptance. As per the detailed drawings and schedule of quantities; the contractor shall work out concurrent activities with start and finish times, integrating of all tasks with interface and milestone event drawn and to evaluate for reduction in total project duration

through improved over lapping of tasks and activities where feasible. The Contractor shall plan for improved planning and scheduling of activities and forecasting of resource requirements, ability to use the computer effectively to produce timely valid information for Project Management purpose. Accordingly, PERT; CPM Networking shall be drawn. GANNT charts shall also be furnished. The Contractor shall also furnish necessary particulars to the Chairman, Department of Civil Engineering, IISc for compiling weekly progress reports in the form furnished by the Institute. A monthly financial programme shall also be submitted.

6.33 CLEARING OF SITE:

The contractor shall after completion of the work clear the site of all debris and left-over materials at his own expense to the entire satisfaction of the Institute. The same should be carted out of the Institute at his own cost.

The contractor shall also clear the labour camp/RMC plant of all types of permanent/temporary structures, soak pits, sump, septic tanks or any other such installations as identified by the Chairman, Department of Civil Engineering, IISc to the entire satisfaction of the Institute. The debris/excess stuff shall be carted out of the Institute at his own risk and cost.

6.34 PHOTOGRAPHS:

The Contractor shall at his own expense supply to the Institute photographs in duplicate copies not less than 25 cm x 20 cm. (10" x 8") along with soft copy, of the works taken from all the portions of the building at intervals of not more than one week during the progress of the work, or at every important stage of construction, as directed by the Chairman, Department of Civil Engineering, IISc.

6.35 PROVISION OF NOTICE BOARD:

The Contractor shall provide a notice board on proper supports 3m x 2m (10' x 6') in a position approved by the Engineer. He shall allow for painting and lettering stating name of work; name of Architects; Structural Consultants; General Contractor and Sub-Contractors. All letters except that of the name of the work shall be in letters not exceeding 5 cm. in height and all to the approval of the Engineer. Proper barricading shall be erected all-round the site before commencement of the work.

6.36 PROTECTION:

The contractor shall properly cover up and protect all work throughout the duration of work until completion, particularly masonry, moldings, steps, terrazzo or floor finishes, staircases and balustrades, doors and window frames, plaster angles corners lighting and sanitary fittings, glass, paint work and all finishing.

6.37 PREPARATION OF BUILDING FOR OCCUPATION AND USE ON COMPLETION:

The whole of the work shall be thoroughly inspected by the Contractors and all deficiencies and defects set right. On completion of such inspection, the Contractor shall inform the Engineer in writing that he has finished the work and it is ready for the Engineer's inspection.

On completion, the Contractor shall clean all windows and doors and all glass panes, including cleaning of all floors, staircases and every part of the building including oiling of all hardware. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the Engineer.

- 6.38 The tenderer must understand clearly that the rates quoted are for complete items of works including charges due to materials, labour, all lead and lift, HOM of plant and machineries, scaffolding, supervision, service works, power, all types of royalties, sales tax, labor cess, all types of taxes payable to the Govt and local bodies, overhead charges, etc., and includes all extra 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 for payment subsequently towards any claims on the grounds of misrepresentation or on point that he was supplied with information given by promise or guarantee by the Institute, or by any person whether member of or employee in Institute will not be entertained. Failure on the contractor's part to obtain all necessary information for the purpose of submitting his tender and quoting rates therein shall not absolve him of any risk or liability consequent upon the submission for tender.
- 6.39 All the works shall be carried out as per specifications prescribed by BIS, National Building code, CPWD / KPWD specifications, relevant IS codes or as directed by the Chairman, Department of Civil Engineering, IISc in the absence thereof.
- 6.40 In case there is any conflict in the specifications and drawings the decision of the **Chairman, Department of Civil Engineering** shall be final and binding on the contractor.
- 6.41 All the materials shall be got approved by the **Chairman, Department of Civil Engineering** before use.
- 6.42 The rates quoted for in individual items shall include labour, cost of materials conveyance and lift charges for all materials required for successful completion of work and all taxes payable to any authority as per rules in vogue from time to time.
- 6.43 Necessary pillars shall be constructed by the Contractor for benchmark at no extra cost as directed by the Chairman, Department of Civil Engineering, IISc.
- 6.44 Site order book shall be maintained in the work spot and the contractor shall sign in the order book in token of having gone through the instructions issued by the inspecting officers and carryout the instructions promptly.
- 6.45 In the work spot the contractor shall provide suitable temporary office with a covered area of 1000 sq.ft matching that of the Contractor's office with necessary furniture for use of Institute as directed by the Chairman, Department of Civil Engineering, IISc for which no extra payment or compensation shall be claimed. The furniture however will after completion of the work, be the property of the contractor and shall remove them at the close of the contract.
- 6.46 The contractor shall take all precautions against damage from accident. No compensation will be allowed to the contractors for their tools and plant materials lost or damaged from any cause. The contractor is liable to make good the structure or plants damaged by any other cause at his own cost. The Institute will not pay the contractor for corrections or repairing any damaged portion of work done during construction.
- 6.47 The contractor shall employ adequate no. of skilled & unskilled labours required for successful timely execution of work. He shall submit daily reports to the Engineer in charge regarding the strength of labour employed both skilled and unskilled.
- 6.48 The contractor shall furnish weekly medical report showing number of persons ill or incapacitated and nature of their illness, to the Chairman, Department of Civil Engineering,

IISc.

- 6.49 The contractor shall furnish a report of any accident which may occur, within 24 hours of its occurrence to the Chairman, Department of Civil Engineering, IISc.
- 6.50 The contractor shall keep on site of work a qualified Engineer as required as per rules of registration as their authorized representative who will receive all instructions given from the Institute officers. The representative shall have permanent office at site of work where communications can be sent and notices can be served by the Chairman, Department of Civil Engineering, IISc throughout the duration of work.
- 6.51 Prior approval should be obtained from the Chairman, Department of Civil Engineering, IISc for the construction and location of the temporary site office, store sheds and labour quarters, within the premises of the site, similarly the contractor shall get approval of the Chairman, Department of Civil Engineering, IISc regarding the areas to be utilized for stacking the materials etc., for the work.
- 6.52 Reference to detailed specifications are indicated against the items contained in the Schedule 'B', in case there is any item for which no detailed specifications is indicated, it shall be carried out as per specifications intimated by the Chairman, Department of Civil Engineering, IISc. The contractor shall not be entitled for any extra claims or compensation on this account. In case of additional or extra items not covered by the Schedule 'B', the contractor shall carry out the work as per specifications intimated by the Chairman, Department of Civil Engineering, IISc.
- 6.53 The Engineer shall have the right to direct the contractor to progress the various items of works in the manner prescribed by him.
- 6.54 Failure to adhere to any of the above will be sufficient cause for taking action under clause (2) or clause (3) or both along with their sub clauses of conditions of contract.
- 6.55 Contractor shall make arrangements at his own cost to construct approach road for conveyance of materials etc., preferably on the alignment accepted by the Institute to procure land etc. for housing, staff and workmen near the site of the work.
- 6.56 It is not possible for the Institute to release any quarry (metal and sand etc.,) for this work. The contractor has to make his own arrangements. No claim regarding leads and lift will be accepted.
- 6.57 The contractor has to make his own arrangements in regard to power supply and water required for construction and drinking water facilities.
- 6.58 Tool, Tax, Octroi, Royalty for collecting earth, gravel, sand, stone, excise duty, sales tax, labour cess or any other tax payable on account of this contract shall be met by Contractor.
- 6.59 The contractor shall be entirely responsible for sufficiency of the scaffolding, timbering, machinery, tools, implement and generally of all means used for fulfillment of the work. Whether such means may not be approved or recommended by the Chairman, Department of Civil Engineering, IISc, the contractor must accept at his own cost all risks of accidents or damages.
- 6.60 After completion of the work, service drawings as per actual execution in Auto CAD should be submitted by the agency for services such as Electrical, Water supply and Sanitary before

submission of final bill.

6.61 Extra care shall be taken regarding the laborers by providing waist belt, Helmets scaffolding etc. at your own cost and supervision and shall be carried out as per the directions of the Chairman, Department of Civil Engineering, IISc.

6.62 WORKMANSHIP AND LABOUR:

The quality of all materials, tools, operators and labour used on the work shall be subject to the approval of the **Chairman, Department of Civil Engineering** or his authorized agent who shall have power to order immediate removal by the contractor any of the above that may not meet with his approval.

In case of failure to carry out orders of removal within the time specified, the Chairman, Department of Civil Engineering, IISc or his authorized agents shall get the same removed at the contractor's expense.

6.63 KEEPING DRY AND PUMPING:

Unless otherwise provided for in the contract, the contractor will at his own expense keep all portions of the work free from undue water, whether due to springs, soakage or inclement weather and will use his own implements and machinery for this purpose.

6.64 BAILING OUT OR DEWATERING:

Adequate arrangements shall be made by the contractor for dewatering the foundation trenches and excavation and keeping the same dry while the masonry or concrete work is in progress and till the Chairman, Department of Civil Engineering, IISc considers that the mortar is sufficiently set.

The rates for the various items include the cost of shoring, strutting, coffer dam, channels or other incidental devices necessary for diverting the water met within foundation. The cofferdam and the diversion channel shall, however, be maintained in good and working condition till the completion of the structure or until such time, as in the opinion of the Chairman, Department of Civil Engineering, IISc till the coffer dam or/and diversion channel is no longer necessary. Bailing out water necessitated by the failure to maintain the cofferdam and diversion channel will not be paid for separately under any conditions.

No extra rate shall be paid for removing any stuff outside, which might find excess due to rains or for reasons whatsoever from the sides or bottom of the foundation trenches and excavation or from also where when the dewatering operations are in progress.

The contractor must assure himself by making the necessary investigation regarding the depths to which foundations are likely to go. If any work is ordered to be done beyond dimensions or deviations marked in the drawings, no extra rate other than the rate for the Undertaking of work quoted by the contractor be paid.

The contractor will make himself arrangements for necessary plant such as Pump, engines, and other materials required in this connection.

6.65 FACILITIES FOR INSPECTION:

The work at all times be open for inspection by the Chairman, Department of Civil Engineering, IISc or his duly authorized Assistant and the contractor shall arrange easy access to every part of the work and shall provide such ladders, scaffolding and lifts for this

purpose as necessary at his own cost.

6.66 DELIVERY OF WORKS:

The final bill will be prepared after the work is handed over to the Chairman, Department of Civil Engineering, IISc or his duly authorized representative in a thoroughly complete, clean, sound and workman like state.

6.67 EXTRA ITEM:

Whenever the contractor is ordered by the Chairman, Department of Civil Engineering, IISc or the person duly authorized by him to execute any item of work, which is not in his tender, it shall be the contractors duty to see that the order is duly entered in the order book on the work, unless a separate communication to this effect is received by him, it shall be his duty to get the rates sanctioned for the item by the appropriate authority. For any extra item of work not thus ordered either by any entry in the order book or separate communication, the contractor shall have no claim to payment.

6.68 COMPLIANCE WITH BYELAWS AND PROTECTIONS AGAINST ACCIDENTS, ETC:

Contractor is responsible for complying with all acts, bye-laws, Municipal and other regulations for the provision and maintenance of lights during nights, barricading, providing any other protection that may be necessary and will be liable for all claims that may arise from accidents of nuisance caused by works.

6.69 DISPUTES:

Disputes on the points between the Chairman, Department of Civil Engineering, IISc and the contractors shall be referred to the Center for campus management and Development, whose decision shall be given in writing and shall be final and binding on the contractor.

6.70 TOOLS ETC.,

The contractor shall unless otherwise specially stated in the contract, be responsible for the payment of all import duties, octroi duties, sales tax, quarry fees etc., on all materials and articles brought to site.

6.71 CLEARANCE OF SITE:

The site described and shown on the plan is to be cleared of all obstruction, loose stones and materials, rubbish of all kinds of shrubs and brushwood, the roots being entirely removed.

The products of the cleaning to be stacked in such a place and manner as ordered by the Chairman, Department of Civil Engineering, IISc.

In jungle clearing all trees not marked for preservation, jungle wood and brushwood shall be cut down and their roots entirely removed up. All wood and materials from the clearings will be property of the Institute and should be stacked as the Engineer in charge directs. Trees shall not be cut without prior permission of the Institute.

All holes or hollow, whether originally existing or produced by digging up roots, shall be carefully filled up with earth well rammed to the required density and leveled off, as may be directed.

6.72 LINE OUT:

The contractor shall use necessary measuring instruments, theodolite, workstation and other materials like flags, strings, pegs, nails, pillars, paints, etc., and also Labour required for ascertaining of the initial ground levels at the different stages of excavation and construction of masonry or other structures at his own cost. Any dispute in regard to the

accuracy of the measuring instruments and the device shall be subjected to the final decision of the Engineer-in charge of the work.

6.73 MACHINERY: All the machinery that will be employed on the work shall be approved, efficient and thoroughly, complying with the specifications of each machine or parts and shall have been manufactured by reputed and qualified firms. All the machinery employed on the work shall be open to inspection at all working hours, by the Chairman, Department of Civil Engineering, IISc and any defect shall be rectified, repaired, replaced, renewed or remodeled so that its performance in the opinion of the Chairman, Department of Civil Engineering, IISc is satisfactory. Any defective part of the machine, which requires replacement, shall be promptly replaced, failing which the Engineer-in-charge, shall be at liberty to cause the defective fittings removed from site of work at the cost of the contractor.

6.74 OPERATORS: The machines shall be in charge of efficient and trained operators, which terms shall include drivers, mechanics or other personnel who are actually operating the machines. The Engineer in-charge has the right to test operators, etc., as deemed necessary by him for the class of machinery, which he is to operate and shall drive out such of the operators who fail in the tests.

6.75 SAFETY PRECAUTION: All reasonable safety precautions for the safety of workers shall be taken. The contractors shall be responsible for the maintenance of all regulations under the Factory Act, workmen's compensation. Minimum wages act and other act for the safety and welfare of the workers employed by him. In addition, the contractors shall provide adequate protection to all workers employed by him against natural elements such as rain, sun, wind etc., during working hours and provide free, pure protected drinking water during working hours.

6.76 NON-STOP OPERATION:

In the continuous or non-stop operations suitable shifts or working hours for each shift shall be maintained. The contractor is liable for all reasonable extra payment for all extra hours of work done by the workers employed by him.

6.77 TESTS:

The **Chairman, Department of Civil Engineering** or his authorized representatives shall have full scope and right of entry at all times to examine and test, measure, count, weigh, take bores, or in any manner satisfy himself that the work executed is according to the specifications and required strength. Any portion of work got disturbed, during such tests, shall be made good by the contractors, without extra cost. The Engineer in charge has the right to change the design proportions, mixes within reasonable limits to ensure requisite strength of the structure. Laboratory for requisite tests shall be established by the Contractor at site only, at his own cost.

6.78 ADEQUATE ARRANGEMENTS TO ACHIEVE PROGRESS:

The Chairman, Department of Civil Engineering, IISc shall have the right to advise the contractor on the strength, quality and nature of labour to be employed on work to maintain progress on the work, commensurate with the strength of structure. Similarly, he shall advise the contractor on the nature and adequacy of the machinery that are required on the work.

6.79 DETAILS TO BE FURNISHED FOR ENGAGING SUB-CONTRACTOR FOR

SPECIALISED WORKS:

The tenderer shall be required to engage agencies of standing and repute who have experience in executing works of similar nature and magnitude. Such specialized trades cover electrical installation (HT/LT), Lifts, A.C. sanitary and water supply works, firefighting installation and any such other trades as may be directed by the Institute. The successful tenderer shall be required to engage Sub-agencies for such specialized trades only with the prior written approval of the **Chairman, Department of Civil Engineering** after giving an opportunity to the **Chairman, Department of Civil Engineering** to evaluate the experience and competence of the sub-agency for each trade. In order to ensure implementation of this requirement, it is required that each tenderer shall submit along with his tender, names of three sub-agencies for each trade amongst whom tenderer proposes to engage if successful in the tender. Along with names of sub-agencies for each trade, the tenderer shall furnish in detail the following particulars in respect of each sub-agency.in the format furnished in Technical Bid.

All such information concerning sub-agencies shall be furnished along with the tender. Any tender containing insufficient information in this regard is liable for rejection. In the event of non-compliance of this requirement, the Institute shall have the right to nominate any sub-agency who in their opinion meets the selection criteria. In such event it would be incumbent on the successful tenderer, to accept and appoint then nominated sub-agency without demur and on this account, if there is any additional cost, such cost shall be borne by the successful tenderer. The Institute shall have no liability on this account. The Institute has the right to evaluate the experience, reputation etc., of such sub-agencies and on their approval in writing to the successful tenderer, successful tenderer shall be required to engage only such approved agencies for execution.

If the Institute is not satisfied with the performance or capability of the names in the panel furnished by the tenderer, the successful tenderer shall be required to engage an agency nominated by Institute. In all these matters, there shall be no additional financial implication to the Institute. The successful tenderer shall be required to execute works within the accepted rates only and no claim will be accepted due to the Institute, insistence on engaging any sub-agency. The Institute further reserves the right to instruct the successful tenderer to terminate the work of sub-agency at any time during the contract, if the performance is found unsatisfactory. In such case, the successful tenderer shall be required to furnish a further panel of names from whom a similar selection can be made by the Institute In this instance also, the Institute is not liable for any additional cost. Responsibility for the delay occurred in this process, if any shall rest with the successful tenderer.

It is the responsibility of the successful tenderer to ensure that the sub-agencies engaged in the work comply with all the clauses in the agreement between the Institute and the successful tender. It shall be responsibility of the successful tenderer to exercise first line supervision on the works executed by his subagencies including supervision on the quality of materials and workmanship and to ensure that the sub agencies comply with the technical specifications, drawings and bill of quantities. The successful tenderer shall also establish competent site organization technically and administratively to ensure that the works of various sub-agencies are supervised and well co-ordinate to ensure proper sequencing of construction and finishing works and to ensure that the overall time schedule is fully complied with.

The detailed construction programme schedule to be furnished by successful tenderer shall include action plan for procurement of materials and execution of works at site for

each of the sub-agency and the detailed construction programme schedule shall reflect proper integration of each component of the building to ensure well-coordinated execution so as to complete the project including services within the stipulated time schedule.

- 6.80 Existing service lines such as electrical, water supply, sewer lines, telephone lines etc., shall be carefully protected and preserved before commencement and during excavation, dismantling /demolition operations. Details of UG facilities shall be provided to the successful tenderer. Any damage caused to the aforesaid service lines, etc., during excavation, demolition/dismantling shall be made good at Contractor's own expense/cost. Restoration of any service lines, which needs to be shifted and found in the proposed site, is the responsibility of the contractor and the agency shall carry out the work as per the direction of Chairman, Department of Civil Engineering, IISc the cost of such work will be borne by the Institute.
- 6.81 Dust nuisance to neighbour shall be minimized by providing and erecting screens to the required height as per direction of **Chairman, Department of Civil Engineering** with Aluminium sheets or canvas or other suitable material before commencement of the work. The site shall be cleared off such protection arrangement after virtual completion of work. All the operations shall be carried out strictly in accordance to regulations of municipal and other local authorities and shall be restricted to normal working hours.
- 6.82 No debris or materials got from dismantlement/demolition the building(s) shall be thrown in the public road causing inconvenience to the traffic and any fine or penalty imposed by local authority for non-compliance of this provision shall be borne by the contractor.
- 6.83 The Contractor shall be responsible for any injury to persons, animals, or things and for all structural damage to property which may arise from the operation or neglect of himself and or any nominated sub-contractors, contractor's Employees and or third party whether such injury or damage arising from carelessness, accident or any other cause whatsoever, in any way connected with the carrying out the construction/dismantling/demolition.

The contractor shall take required insurance cover with an approved insurance company as provided in the contract and deposit with the Institute well before commencement of construction/ demolition / dismantling.

- 6.84 **Preservation of trees:** The contractor shall preserve all existing trees in and adjacent to
- 6.85 the site which does not interfere with the construction as determined by the Engineer-in charge.
- 6.86 **Drawings and working Details:** The work shall be carried out strictly in accordance with the approved plans and estimates and specifications and as per the instructions of the Engineer-in-charge, and no deviations or changes are permitted without the written order of the Engineer. The designs and drawings enclosed with the tender documents are only typical and tentative. The working drawings and the working details of the several components of works will be prepared and made available at the time of execution and the contractor shall carryout the work in accordance with such working drawings and working details.
- 6.87 **Omissions and discrepancies in drawings and instructions:** In all cases of omissions, doubts or discrepancies in the dimensions or discrepancies in the drawings and item of work, a reference shall be made to the **Chairman, Department of Civil Engineering**, whose elucidation and elaboration shall be considered as

authorized. The Contractor shall be held responsible for any error that may occur in the work through lack of such reference and precautions.

6.88 The contractor shall be responsible for accuracy for all shapes, dimensions, and Alignments both vertical and horizontal etc., of all the components of the work.

6.89 Lands for the use of the Contractors Camp:

The contractor shall have to make his own arrangements at his own cost for construction of living accommodation outside the IISc premises. The Employee shall not provide any space / building for labour camp.

6.90 Undesirable Person to be removed from site:

The contractor shall not employ on site any person who is undesirable, if in the opinion of the Chairman, Department of Civil Engineering, IISc the person or persons at site of work employed on behalf of the contractor is/are considered undesirable. The Chairman, Department of Civil Engineering, IISc shall notify the contractor to this effect and the contractor will be bound by the decision of the Chairman, Department of Civil Engineering, IISc to remove such person or persons from the site of work and from the labour camp. The contractor shall not be entitled to any damage or loss on this account. On the contrary, the contractor shall be liable to compensate the Institute for any loss or damage to the Institute property caused by the employment of such person.

6.91 Labour Statistics:

The contractor shall submit daily reports on the following:

(a) Total No. of labour employed in the working area.

6.92 Execution of work during nighttimes:

The work shall normally be carried out between 08.00 hours and 17.00 hours with a break of one hour and when permitted during night period, the second shift shall be between 17.00 hours and 00 hours with a break of half an hour during night. When ordered to work at night, adequate provision for lighting the working area should be made by the contractor at his cost and got approved by Engineer. The agency shall not be paid extra for the works executed during night.

6.93 Safety code:

- a) The Contractor at a prominent place at work spot should bring these safety provisions to the notice of all concerned by display on notice board. The persons responsible for compliance of the safety code shall be named therein by the contractor.
- b) To ensure effective enforcement of the rules relating to safety precautions, the arrangement made by the contractor shall be open to inspection by the Labour Officer, Engineer or his representatives.
- c) All necessary personal safety equipment's as considered adequate by the Engineer should be kept available for immediate use of persons employed at the site and maintained in the good condition and the contractor should take adequate steps to ensure proper use of equipment by those concerned.
- d) Workers employed on mixing concrete, cement grout, cement mortar shall be provided with protective footwear protective goggles and protective gloves. Those engaged in mixing or stacking cement or any materials injurious to the eye, nose and mouth shall be provided with a face mask and protective cover free of cost by

- the contractor.
- e) Those engaged in welding work shall be provided with welder's protective eye Shield and gloves. Stonebreakers shall be provided with protective goggle and protective clothing and seated at sufficiently safe intervals.
 - f) Those engaged in binding and fabricating steel shall be provided with protective gloves.
 - g) Those engaged in deep cuts, large rock excavation shall be provided with helmets.
 - h) All labour / persons at work shall wear helmet compulsorily.
 - i) When the work is near any place where there is risk of drowning all necessary equipment's shall be kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be sustained during the course of work.
 - j) Adequate and suitable caution and danger signal boards shall be prominently exhibited at road/high tension overhead line/where heavy electrical machines are working where overhead cranes or hoist; derricks, winches are working where blasting zone is demarcated. The content of the board shall be in English and the local language for easy identification.
 - k) All scaffolding, ladder, stairways, gangways, staging, centering, form work and temporary support and safety devices etc., shall be sound in strength and constructed and maintained as such throughout its use. The agency shall obtain approval from **Chairman, Department of Civil Engineering** for scaffolding, formwork etc., before commencement of work.
 - l) No materials on any site of work shall be so stacked as to cause danger or inconvenience to any persons or public.
 - m) The Contractor shall provide all necessary fencing and lighting to protect the public/working men from accident and shall be bound to bear the expense of defense of every suit action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost, which may be awarded in any such suit action or proceedings to any such persons or which may with consent of the contractor be paid to compensate any claims by any such person.
 - n) No electric cables or apparatus, which is liable to be a source of danger to persons, employed shall remain electrically charged unless a caution Board is put into that effect and close approach to the same is prohibited.
 - o) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosives. No floor, roof or other portion of any building used for residence shall be so over-loaded with debris or materials so as to render it unsafe.
 - p) The final disposal of water used for work or removed from work spot as well as the supply used for domestic consumption shall be as directed by the Engineer. The contractor shall make his own arrangement for purification of domestic water supply used by his staff and labour colony and used on the site of work to the satisfaction of the Engineer.
 - q) The source of drinking water supply/distribution system in workers colony shall be protected from chances of contamination by poisonous materials epidemic causing infections bacteria etc., by maintaining the source and system under adequate hygienic conditions.
 - r) Notwithstanding the above clauses, there is nothing in this to exempt the contractor to exclude the operations of any other Act or Rules in force of the Central

6.94 AWARENESS OF SITE CONDITIONS AND CARRYING OUT OF SITE INSPECTION PRIOR TO TENDER SUBMISSION:

Prior to the preparation and submission of his Tender, the Contractor shall make visits to the site and carry out all the necessary inspections and investigations in order to obtain all information and to make his own assessment of the conditions and constraints at site, including the means of access to it. The Contractor shall make himself aware of all the features of the site and the working conditions and space and shall, in general, be responsible for obtaining all the necessary and requisite information needed for him to prepare and submit his Tender.

Should the Contractor require any clarifications he shall seek these in writing from the Chairman, Department of Civil Engineering, IISc before submitting his Tender. At no stage will any extra claims be entertained or allowed on any matter or for any reason arising from or as a consequence of the Contractor's failure to comply with all the requirements stipulated in this Clause.

6.95 WORK AND WORKMANSHIP

To determine the acceptable standard of workmanship, the Chairman, Department of Civil Engineering, IISc may order the Contractor to execute certain portions of works and services under the close supervision of the Chairman, Department of Civil Engineering, IISc. On approval, they shall label these items as guiding samples so that further works are executed to conform to these samples.

6.96 TEST CERTIFICATES

The contractor shall submit copy of test certificates for all the major electrical equipment such as circuit breakers, CTs, PTs, instruments, relays, busducts, rising mains, busbars, cables etc., and panel as a whole, confirming to relevant IS/BIS standards issued by manufacturers.

6.97 SAMPLES AND CATALOGUES

Before ordering the material necessary for these installations, the contractor shall submit to the Engineer-in-Charge/Consultants for approval, a sample of every kind of material such as cables, conductors, conduits, switches, socket outlets, circuit breakers, lighting fixtures, boxes etc., along with the catalogues with their dimensional details.

For major items such as sub lighting panels distribution boards, the submission of drawings/catalogues along with technical details shall be enough. Prior to ordering any electrical equipment/material/system, the contractor shall submit to the Engineer-in-Charge/Consultants the catalogues, along with the samples, where applicable, from the approved manufacturer. The contractor shall arrange inspection and testing at the manufacturer's factory or assembly shop for final approval. No material shall be procured prior to the approval of the Engineer-in- Charge/Consultant.

Also, the contractor shall ensure that the dimensional details of the equipment fit into the allotted space provided in the building.

6.98 COMPLETION CERTIFICATE

On completion of the electrical installation a certificate shall be furnished by the contractor countersigned by the licensed supervisor, under whose direct supervision the

installation was carried out.

6.99 PERFORMANCE GUARANTEE

The contractor shall indemnify the Institute against defective materials and workmanship for a period of one year after completion of the work. The contractor shall also hold himself fully responsible during that period for reinstallation or replacement at free of cost to institute, the following:

Any defective work or material supplied by the Contractor.

Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.

6.100 RATE ANALYSIS

At any time and at the request of the Chairman, Department of Civil Engineering, IISc the contractor shall provide details or breakdown of costs and prices of any part or parts of the works.

6.101 The **Chairman, Department of Civil Engineering**, IISc reserves the rights to delete any item from the contractor's scope of work.

7 CONTRACTOR'S LABOUR REGULATIONS

7.1 DEFINITION:

In these regulations unless otherwise, expressed or indicated the following words and expressions shall have the meaning hereby assigned respectively that is to say:

Labour means workers employed by the contractor or the Institute directly or indirectly through sub-contractor or any other person, or any agent on his behalf on a payment as per prevailing Karnataka State labour regulations and will not include supervisory staff like overseers etc.

Fair wages means whether for item or place of work notified at the time of inviting tenders for the work and where such wages have not been so notified, the wages prescribed by the Karnataka Public Works Department for the district in which the work is done.

Contractors shall include every person whether a sub-contractor head or agent employing labour on the work taken contract.

The relevant orders of Government of Karnataka in regard to payment of wages as amended from time to time shall be followed by the contractor.

7.2 WORKING HOURS:

Normally working hours of a labour employed should not exceed 8 hours a day. The working day shall be so arranged that inclusive of interval for rest if any, it shall not spread over more than 12 hours on any day.

When a worker is made to work for more than 8 hours on a day or for more than 48 hours in any week, he is entitled to double the ordinary rate of wages. Children shall not be made to work.

Every worker shall be given a paid weekly holiday normally on Sunday.

7.3 DISPLAY OF NOTICE REGARDING WAGES ETC.

The contractor shall (a) before he commences his work on contract, display and correctly maintain in a clean legible condition in conspicuous places on the work, notices in English and in the local language spoken by the majority of the workers, giving the rate of wages which have been certified by the Regional Labour Commissioner, as fair wages and the hours of work which such wages are earned, and a copy of such notices shall be sent to the certifying officers.

7.4 PAYMENT OF WAGES:

Wages due to every worker shall be paid to him direct.

7.5 FIXATION OF WAGES PERIODS:

The contractor shall fix the wages period of which the wages shall be payable.

Wages of every worker employed on the contract shall be paid.

In case of establishments in which the wage period is one week, within three days from the end of the wage period wages shall be paid. In the case of other establishment before the expiry of the 7th day or 10th day from the end of the wage period according to the numbers of the workers employed in such establishment does not exceed 100 or exceeds 1000.

When the employment of any workers is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the days succeeding the one which his employment is terminated.

All payment of wages shall be made on a working day except when the work is completed before the expiry of the wages period in which case final payment shall be made within 48 hours of the last working day at work site and during the time.

NOTE: The term working day means a day on which the labour is employed, and the work is in progress.

7.6 FINE AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES:

The Wages of workers shall be paid to him without any deductions of any kind except the following deductions:

Deductions for absence for duty i.e., from the place or the places whereby the terms of his employment he is required to work. The amount of deductions shall be in proportion to the period for which he was absent.

Deductions for damage or loss of goods expressly entrusted to the employed person for custody or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to neglect or default.

Deduction for recovery of advance or for adjustment of over payment of wages, advance granted shall be entered in a register.

And other deductions which the Institute may from time to time allow.

7.7 Fine:

No fine shall be imposed on any worker save in respect of such acts and the Commissioner of Labour has approved omissions on his part as.

No fine shall be imposed on a worker and no deduction for damage or loss be made from his wages until the worker has been given an opportunity. Undertaking of showing cause against such fines or deductions.

The total amount of fines which may be imposed in any one wage period on a worker shall not exceed an amount equal to the wages payable to him in respect of that wage period.

No fine imposed on any worker shall be recovered from him by instalments or after the expiry of sixty days from the date which it was imposed.

Every fine shall be deemed to have imposed on a day of the act or omission in respect of which it was imposed.

The contractor shall issue an employment card in Form III to each worker on the day of the worker's entry into the employment. If the worker has already any such card with him for the previous employment of contractor, he shall merely endorse that employment card with relevant entries. On termination of employment, the employment card shall again be endorsed by the contractor and returned to the worker.

7.8 REGISTER OF UNPAID WAGES:

The contractor should maintain a register of unpaid wages in such a form as may be convenient at the place of work but same shall include the following particulars:

- Full particulars of the labourer's whose wages have not been paid.
- Reference number of the muster roll and wage register
- Rate of wages
- The period
- Total amount not paid
- Reasons for not making payment
- How the amount of unpaid wages was utilized
- Acquaintance with dates.

7.9 REGISTER OF ACCIDENTS:

The contractor shall maintain a register of accidents in such form as may be convenient at the workplace but the same shall include the following particulars.

- Full particulars of the laborers who met with accidents.
- Rate of wages
- Sex
- Age
- Nature of accidents and cause of accident
- Time and date of accidents
- Date and time when admitted in Hospital
- Date of discharge from the Hospital.

The agency shall alone be liable to pay compensation for any damage/death /injury sustained by the personnel or any other members of the agency in the course of their work/duty at the Institute during the contract period. Govt. of India issued guidelines on payment of compensation in cases of death / permanent incapacitation of person due to unintended/unforeseen occurrences during maintenance, operation and provisioning of public services. Under these guidelines, the agency has to pay an amount of Rs. 10 Lakhs as compensation in the cases where a person is died and up to Rs. 7.5 Lakhs in the case of disabled based on loss of earning capacity. Institute has the right to recover further penalty in the cases where the incidents have happened with the negligence of the agency.

7.10 REGISTER OF FINES ETC.

The contractor shall maintain a register of fines and a register of deductions for damages or loss in form Nos. I and II respectively which shall be kept at the place of work.

The contractor shall maintain both in English and local language a list approved by Commissioner for labour clearly stating the acts and commissions for which penalty or fine may be imposed on a workman and display it in a good condition in conspicuous place on the work.

7.11 SUBMISSION OF RETURNS:

The contractor shall submit periodical returns as may be specified from time to time.

7.12 AMENDMENTS:

The Government of Karnataka may from time to time add to or amend the regulations and on may question as to the application interpretation on effect if these regulations the decision of the Commissioner of Labour or Deputy Commissioner for Labour to Govt. in that behalf shall be final.

7.13 Labour Clause

No labourers below the age of 18 years shall be employed on the work.

Payments of wages of labourers. The contractor shall pay not less than fair wage of labourers engaged by him on the work.

EXPLANATION:

(a) The contractor shall notwithstanding the provision of any contract to the contrary cause to be paid wages to labourers indirectly engaged for the work including any labour engaged by his sub-contractors in connection with the same works if the labourers have been immediately employed by him.

(b) In respect of all labours directly or indirectly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with or cause to be complied with Govt. of India, Contractors Labour Regulations from time to time, in regard to payment of wages. Wage period, deductions from wages recovery of wages not paid and deductions unauthorized made, maintenance of wage book, wage slips, publication of scale of wage and other terms of employment, inspection and submission of periodical returns and all other matter of a like nature.

The **Chairman, Department of Civil Engineering** or In-charge Engineer concerned shall have the right to deduct from the money due to the contractors any sum required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or her wages which are not justified by their terms of the contractor non-observance of the regulations.

(c) For payment of minimum wages, the Contractor is bound to follow the relevant orders of Govt. of India from time to time.

(d) Vis-à-vis the Institute the contractor shall be primarily liable for all payments to be made under and for the observance of the regulations aforesaid without prejudice to his right to claim indemnity from his sub-contractors. The regulations aforesaid shall be deemed to be part of this contract, and any breach thereof shall be deemed to be a breach of this.

7.14 In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this agreements the contractor shall at his own expense arrange for the safety provisions as per Karnataka P.W.D. safety code framed from time to time and shall at his own expense provide for all facilities in arrangements and provide necessary facilities as aforesaid he shall be liable to pay penalty of Rs.50/- for each default and in addition the **Chairman, Department of Civil Engineering** shall be at liberty to make arrangements and provide facilities as aforesaid, and recover the cost incurred in that behalf from the contractor.

7.15 The contractor shall submit by the 4th and 19th of every month to the Chairman, Department of Civil Engineering, IISc of true statement showing in respect of the second half of the preceding month and the first half of the current month respectively (1) the name of labourers employed by him on the work (2) their working hours, (3) the wages paid to them, (4) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused to them and (5) the number of female workers who have been allowed, maternity benefit according to clause 19F and the amount paid to them, failing which the contractor shall be liable to pay the Institute a sum of not exceeding Rs. 50/- for each default or materially incorrect statement by deduction from any bill due to the contractor and amount levied as fine.

7.16 In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with or cause to be

complied with all the rules framed by Institute from time to time for the protection of health and sanitary arrangements for workers employed by the Indian Institute of Science and its contractors.

7.17 Maternity benefit rules for female workers employed by contractor, leave and pay during leave shall be regulated as follows:

(i) in case of delivery: Leave during maternity leave not exceeding 8 weeks up to and including the day of delivery and 4 weeks following that day.

(ii) In case of miscarriage, up to 3 weeks from the date of miscarriage.

7.18 Pay:

i) In case of delivery: Leave pay during maternity leave will be at the rate of women's average daily earning calculated on the total wages earned on the days when full time work was done during the period of three months immediately preceding the date on which she gives notice that she expects to be confined.

ii) In case of miscarriages: Leave pay at the rate of average daily earnings calculated on the total wages earned on the day's full time works was due during a period of 3 months immediately preceding the date of miscarriage.

iii) Conditions for the grant of maternity leave: No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than 10 Months immediately preceding the date of delivery /miscarriage.

8 CONDITIONS OF CONTRACT

Clause 1. Security Deposit

Estimated cost of the work put to tender	E.M.D. Percentage	F.S.D. Percentage
(i)	(ii)	(iii)
Rs. 32696923.00	1.5%	6%
Note : EMD + FSD to be limited to 7.5% of the contract value		

- (a) Clause -1(a)** The person/persons whose tender may be accepted (hereinafter called the contractor which expression shall unless the context otherwise requires, include his heirs, executors, administrators and assigns) shall pay Earnest Money Deposit indicated in Column (ii) of the table given below and shall permit Institute (a) to deduct FSD at the percentage mentioned in Column (iii) of the table given below of all moneys payable of work done under the Contract, at the time of making such payments to him/them and (b) to hold such deductions as further Security Deposit. The EMD + FSD will be limited to 7.5% of the contract value.

E.M.D - Earnest Money Deposit

F.S.D - Further Security Deposit

No Interest will be paid on EMD / Further / Additional Security deposit.

(b) Additional or Reduction in Security Deposit

The EMD for the tendered work and additional amount of Security Deposit at the rates mentioned in **Sub-clause 1(a)** above should be, paid by the contractor. The **Chairman, Department of Civil Engineering** may allow if a portion of the work is withdrawn from the Contractor under the provisions of Clause 12(a) a proportionate reduction in the amount of security Deposit.

- a) EMD paid along with the tender shall be refunded only after the completion of the defect liability period or payment of final bill whichever is later without any interest.**
- b) 1% labour cess towards workers Welfare Fund on the works expenditure will be recovered from RA bills for depositing the same to the welfare board as per Karnataka Govt. Order. Rates quoted should be inclusive of cess.**
- (c)** However, if the Contractor desires, agency may furnish a BG issued by the Public Sector Undertaking Bank / Scheduled commercial Bank / Nationalized Bank in favour of the Registrar, Indian Institute of Science, payable at Bangalore amounting to **6%** of the total contract value valid up to completion of defect liability period in which case EMD deposited by them will be refunded and no recoveries towards security deposit will be effected in the running account bills.
- (d) Dues to Institute, to be set off against Security Deposit.**

All compensation or other sums of money payable by the Contractor to Institute under the terms of this contract may be realized or deducted from any Security Deposit payable to him or from any sums which may be due or may become due by Institute to the Contractor on any account whatsoever and in the event of his security deposit being reduced by reason of any such realization or deduction as aforesaid, the Contractor

shall, within ten days thereafter, make good in cash any sum or sums which have been deducted from his security deposit or any part thereof. Otherwise, the amount will be treated as outstanding due from the agency.

(e) Refund of Security Deposit (EMD & FSD):

i) EMD paid by the contractor at the time of tendering and FSD deducted from the R.A bills at the prescribed rates shall be refunded to the contractor immediately after the virtual completion of the work against production of bank guarantee for an equal amount from any of the Scheduled commercial Bank/Nationalized Bank valid for a period as mentioned in clause (ii) below.

ii) The bank guarantee received as stipulated in (i) above, will be treated as performance guarantee and shall be returned to the contractor after the final bill is paid or after **Twenty Four Months including monsoon period** from the date of virtual completion of the work during which period the work should be maintained by the contractor in good order, whichever is later. The validity of the bank guarantee shall be maintained for the above period.

iii) In case of BG's furnished towards security deposit same shall be returned after completion of the defect liability period.

Clause 2. PENALTY FOR DELAY

a) Written Order to Commence Work

After acceptance of the tender, the **Chairman, Department of Civil Engineering** shall issue a written order to the successful Tenderer to commence the work. The Contractor shall enter upon or commence any portion of work only with the written authority and instructions of the **Chairman, Department of Civil Engineering**. Without such instructions the Contractor shall have no claim to demand for measurements of or payment for, work done by him.

b) Programme of work

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor. It shall be reckoned from the date of handing over the site to the Contractor not less than 75 percent of work site area comprising a continuous block. The work shall throughout the stipulated period of the contract be proceeded with, all due diligence (time being deemed to be the essence of the contract on the part of the Contractor). To ensure good progress during the execution of the work, the contractor shall be bound (in all cases in which the time allowed for any work exceeds one month) to comply with the time schedule according to the programme of execution of the work as agreed upon and enclosed by the contractor during execution of agreement.

c) Review of progress and responsibility for delay etc.,

The **Chairman, Department of Civil Engineering** shall review the progress of all works with the contractor at least once every month. Such a review shall take into account the programme fixed for the previous week, obligations on the part of the Institute for issue of drawings etc, and also the obligations on the part of the Contractor. The review shall also examine the accumulated delays by the contractor if any and mitigation measures proposed by the contractor to overcome the delay.

Apportioning of responsibility for delay between Contractor and Institute.

In case the progress achieved falls short by more than 25 percent of the cumulative programme, the reasons for such shortfall shall be examined and a record made thereof apportioning the responsibilities for the delay between the contractor and the Institute. This record should be signed in full and dated both by the **Chairman, Department of Civil Engineering** and the Contractor. If the contractor refuses to sign the said record, approval of the reasons for delay may be submitted to **Department of Civil Engineering** for approval and such approval is binding on the contractor.

Shortfall in progress made up subsequently.

To the extent the shortfall is assessed, as due to the delay on the part of the contractor, a notice shall be issued to him by the **Chairman, Department of Civil Engineering** to make up the shortfall. If the shortfall is not made up before the progress of the work is reviewed during the second month succeeding the month in which the shortfall was observed, the Contractor shall be liable to pay penalty as indicated in **Clause 2(d)** below.

Grant of extension of time.

If the delay is attributable to reasons beyond the control of the Contractor, requisite extension of time shall be granted by the Chairman, Department of Civil Engineering in accordance with **Clause 5** after obtaining the approval of his higher authorities, wherever necessary.

Review of progress by Department of Civil Engineering.

The Department of Civil Engineering shall review the progress periodically, preferably more number of times as required. These reviews are in addition to the monthly reviews required to be done by the Chairman, Department of Civil Engineering. The results of such review by the Department of Civil Engineering shall, wherever necessary, be incorporated in the next review of the **Chairman, Department of Civil Engineering**.

If the Contractor stops the work for 45 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Employer, then The Employer may terminate the Contract at the risk and cost of the contractor.

Settlement of dispute regarding shortfall in progress.

In case of dispute between the **Chairman, Department of Civil Engineering** and Contractor regarding the responsibility for the shortfall in progress, the matter shall be referred to the Department of Civil Engineering who shall thereupon give a decision within fifteen days from the date of receipt of reference. The decision of the Department of Civil Engineering shall be final and binding on the contractor and the **Chairman, Department of Civil Engineering**.

d) Penalty for delay

In respect of the shortfall in progress, assessed as due to the delay on the part of contractor as per **Clause 2(b)** and **2 (c)**, the contractor shall be liable to pay as penalty an amount equal to one percent of the contract value of the balance work assessed according to the programme(Clause 35), for every week that the due quantity of work remains incomplete; provided always that the total amount of penalty to be paid under

the provisions of this clause subjected to a maximum of 10 percent of the contract value of the entire work as shown in the tender, provided further that in the event of the contractor making up the shortfall in progress within the stipulated or extended time of completion, the penalty so recovered may be refunded on an application in writing by the contractor.

Note: If the **Chairman, Department of Civil Engineering** considers it necessary, he shall be entitled to take action as indicated in **Clause 3 (d)** also.

d.(1). Liquidated damages

The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestone as stated in the Contract Data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages does not affect the Contractor's liabilities.

If the Intended Completion Date is extended after liquidated damages have been paid, the Employer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment of bill.

(e) Adjustment of excess/over payments.

Excess/over payments as soon as they are discovered should be adjusted in the next running account bill of the contractor and in case the final bill has already been paid, the excess/over payment made shall be recovered from the Security Deposit of the contractor together with interest at such percentages as Institute may decide from time to time, from the date of such excess or over payment to the date of recovery.

ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED

Clause 3. In any case in which under any clause or clauses of this contract the contractor shall have rendered himself liable to pay compensation and/or penalty amounting to the whole of his security deposit including the amount deducted in instalment from his bills as Further Security Deposit, the **Chairman, Department of Civil Engineering** on behalf of the Director, IISc shall have power to adopt any of the following courses as he may deem best suited in the interest of Institute.

(a) Forfeiture of Security Deposit.

Without prejudice to Institute's right to recover any loss from the Contractor under sub-clauses (b) and (c) of Clause 3 of the Contract, to rescind the contract (of which rescission notice in writing to the contractor under the hand of the **Chairman, Department of Civil Engineering** shall be conclusive evidence). And in that case, the security deposit of the contractor including whole or part of the lump sum deposited by him and also the amount deducted from his bills as Further Security Deposit, shall stand forfeited and be absolutely at the disposal of the Institute.

(b) Debiting cost of labour and materials supplied.

To employ labour paid by the Institute and to supply materials to carry out the work or any part of the work, debiting the contractor with the cost of the labour and the price of the materials (as to the correctness of which cost and price the certificate of the **Chairman, Department of Civil Engineering** shall be final and conclusive against the contractor) and crediting him with the value of the work done; in all respects in the same manner and at the same rates as if it had been carried out by the contractor under terms of this contract, and in that case the certificate of the **Chairman, Department of Civil Engineering** as to the value of the work done shall be final and conclusive against the contractor.

(c) Recovery of extra cost on unexecuted work

To measure up the work of the contractor and to take such part thereof as is remaining unexecuted out of his hands and to give it to another contractor to complete it 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 (as to the amount of which excess expenses the certificate in writing of the **Chairman, Department of Civil Engineering** shall be final and conclusive) shall be borne and paid by the original contractor and shall be deducted from any money due to him by Institute. Otherwise the amount will be treated as outstanding due from the agency.

(d) Action against unsatisfactory progress

If the contractor does not maintain the rate of progress as required under **Clause 2** and if the progress of any particular portion of work is unsatisfactory even after taking action under **Clause 2(c)** and **2(d)**, the **Chairman, Department of Civil Engineering** shall be entitled to take action under **Clause 3(b)** or **3(c)** at his discretion in order to maintain the rate of progress after giving the contractor 10 days notice in writing whereupon the contractor will have no claim for any loss sustained by him owing to such actions.

(e) No compensation for loss sustained on advance action

In the event of any of the above courses being adopted by the **Chairman, Department of Civil Engineering**, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased, or procured any materials, entered into any agreements or made any advances on account of, or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under the provision aforesaid the contractor shall not be entitled to recover or be paid any sum for any work thereof actually performed by him under his contract, unless and until the **Chairman, Department of Civil Engineering** shall have certified in writing the performance of such work and the amount payable in respect thereof, and he shall only be entitled to be paid the amount so certified.

(f) Recovery of 1% of the contract value towards the laborers welfare fund created by the Government of Karnataka will be effected in the running account bills of the contractor.

Clause 4. CONTRACTOR TO REMAIN LIABLE TO PAY COMPENSATION IF ACTION IS NOT TAKEN UNDER CLAUSE-3.

In any case in which any of the powers conferred upon the **Chairman, Department of Civil Engineering** by **Clause 3** thereof shall have become exercisable and the same shall not have been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in

the event of any future case of default by the contractor for which under any clause hereof he is declared liable to pay compensation or penalty amounting to the whole of his security deposit and the liability of the contractor for past and future compensation or penalty shall remain unaffected.

Power to take possession of or require removal of or sell contractor's properties.

In the event of the **Chairman, Department of Civil Engineering** taking action under **sub-clause (a) or (c) of Clause 3**, he may, if he so desires, take possession of all or any tools, plant, materials and stores, in or upon works or the site thereof or 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 the case of contract rates not being applicable, at current market rates, to be certified by the **Chairman, Department of Civil Engineering** whose certificate thereof shall be final. In the alternative, the **Chairman, Department of Civil Engineering** may after giving notice in writing to the contractor or his clerk of the works, foreman or other authorised agent, require 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 **Chairman, Department of Civil Engineering** may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respect, and the certificate of the **Chairman, Department of Civil Engineering** as to the expense of any such removal; and the amount of the proceeds and expense of any such sale shall be final and conclusive against the contractor.

Clause 5. GRANT OF EXTENSION OF TIME

- (a) If the contractor shall desire an extension of the time for completion of the work, he shall apply in writing to the **Chairman, Department of Civil Engineering** before the expiry of the period stipulated in the tender or before the expiry of 30 days from the date on which he was hindered as aforesaid or on which the cause for asking for extension occurred, whichever is earlier and the **Chairman, Department of Civil Engineering** or other competent authority may if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of such competent authority in this matter shall be final.
- (b) The time limit for completion of the work shall be extended commensurate with its increase in cost occasioned by alterations or additions and the certificate of the **Chairman, Department of Civil Engineering** or other competent authority as to such proportion shall be conclusive.

Clause 6. ISSUE OF FINAL CERTIFICATE – CONDITIONS REGARDING

On completion of the work the contractor shall report in writing to the **Chairman, Department of Civil Engineering** the completion of the work. Then he shall be furnished with a certificate by the **Chairman, Department of Civil Engineering** of such completion, but no such certificate shall be given nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall have been executed, all scaffolding, surplus materials and rubbish, and shall have cleaned thoroughly all wood work, doors, windows, wall, floor or other parts of any building, in or upon which the work has been executed, or of which he may have had possession for the purpose of executing the work, nor until the works shall have been

measured by the **Chairman, Department of Civil Engineering** or other competent authority, or where the measurements have been taken by his Chairman, Department of Civil Engineering, IISc until they have received the approval of the Chairman, Department of Civil Engineering or other competent authority, the said measurements being binding and conclusive against the contractor. If the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish, and cleaning on or before the date fixed for the completion of the work the Chairman, Department of Civil Engineering or other competent authority may, at the expense of the contractor, remove such scaffolding, surplus materials and rubbish, and dispose of the same as he think fit and clean off such dirt etc., as aforesaid and contractor shall be liable to pay the amount of all expenses incurred but shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

Note: CLOSURE OF CONTRACT PENDING COMPLETION OF MINOR ITEMS.

In cases where it is not desirable to keep the building contract open for minor items, such as flooring in the bathrooms, etc., which can be carried out only after installation of sanitary work the main contract may be finalized after getting a supplementary agreement executed in the prescribed form by the same contractor for doing the residual work.

Clause 7. Contractor to submit bills monthly in printed form

- (a) A bill shall be submitted by the contractor on or before 15th of each month for all items of work executed in the previous month as required by IISc. The Running account bills will be paid within three weeks from the date of submission of the bill in complete acceptable form after duly checked and certified by concerned Engineer, under normal circumstances.

All bills shall be prepared in the prescribed printed and electronic form in PDF/Excel format in quadruplicate and handed over to the Chairman, Department of Civil Engineering, IISc in charge of the work/ Chairman, Department of Civil Engineering's Office and acknowledgment obtained.

The charges to be made in the bills shall always be entered at the rates specified in the tender in full or in part as the case may be, in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender, the charges in the bills shall be entered at the rates hereinafter provided for such work.

(b) Scrutiny of Bills and measurement of work

The details furnished by the Contractor in the bill will be completely scrutinized and the said work will be measured by the Chairman, Department of Civil Engineering, IISc in the presence of the Contractor or his duly authorized agent. The countersignature of the contractor or the said agent in the measurement book shall be sufficient proof to the correctness of the measurements, along with the Test certificates to be produced with the bill, which shall be binding on the contractor in all respects.

- (c) One copy of the passed bill shall be given to the Contractor without any charge.

Clause 8. PAYMENT PROPORTIONATE TO WORK APPROVED AND PASSED.

No payment shall be made for any work estimated to cost rupees five thousand or less until after the whole of the work shall have been completed and certificates of completion given. But in the case of works estimated to cost more than Rs. 5,000 the contractor shall on submitting the bill and after due verification by the Chairman, Department of Civil Engineering, IISc as per Clause 7(b) entitled to necessary Payment proportionate to the part of the work then approved and passed by the Chairman, Department of Civil Engineering or other competent authority whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor i.e. part payment of submitted RA bills is admissible to contractor. Any such reduced payment amount is admissible for adjustment in the successive RA Bills or Final Bill.

Payment at reduced rates

The rates for several items of works agreed to within shall be valid only when the items concerned are accepted as having been completed fully in accordance with the stipulated specifications. In cases where the items of work are not accepted as so completed, The Chairman, Department of Civil Engineering or other competent authority may make payment on account of such items at such reduced rates as he may consider reasonable in the preparation of final or on account bills.

Payment or intermediate certificates be regarded as advances:

All such intermediate payments shall be regarded as payments by way of advance against the final payments only and not as payments for work actually done and completed, and shall not preclude the Chairman, Department of Civil Engineering or other competent authority from requiring any bad, unsound imperfect or unskilful work to be removed or taken away and reconstructed or re-erected nor shall any such payment be considered as an admission for the due performance of the Contract or any part thereof in any respect or the accruing of any claim, nor shall it conclude determine or affect in any other way the powers of the Chairman, Department of Civil Engineering or other competent authority as to the final settlement and adjustment of the accounts, or otherwise or in any other way vary or affect the contract.

Submission of Final bill and its settlement

The contractor shall submit the final bill within one month from the date of actual completion of the work in all respects. His claims shall be settled within five months from the date of submission of the bill in complete acceptable form after duly checked and certified by concerned Engineer, under normal circumstances.

Disputed items

Note: The contractor shall submit a list of the disputed items within 30 days from the disallowance thereof and if he fails to do this, his claim shall be deemed to have been fully waived and absolutely extinguished.

Clause 9. Definition of Work :

- a. The expression 'Work' or 'Works' where used in these conditions, shall unless there be something in the subject or context repugnant to such construction, be construed to mean the work or works contracted to be executed under or in virtue of the contract, whether temporary or permanent and whether original, altered, substituted or additional.

b. Work to be executed in accordance with specifications, drawings, orders etc.

The contractor shall execute the whole and every part of the work in the most sound and substantial and workmanlike manner, and in strict accordance with the specifications both as regards materials and workmanship. The contractor shall also conform exactly, fully and faithfully to the designs, drawings and instructions in writing relating to the work signed by the Chairman, Department of Civil Engineering or other competent authority and lodged in his office and to which the contractor shall be entitled to have access at such office, or on the site of the work for the purpose of inspection during office hours. The contractor shall also be responsible for the delivery of structure in sound conditions and the execution of the work strictly in accordance with the specifications of the work.

c. Action where there is no specification

In the case of any class of work for which there is no such specification, then in such a case of the work shall be carried out in all respects in accordance with the instructions and requirements of the Chairman, Department of Civil Engineering or other competent authority.

d. Work as per Specifications and IS Codes.

The detailed specification, which forms a part of contract, accompanies the tender document. In carrying out the various items of work as described in Schedule B of the tender documents and the additional, substituted, altered items of work, this detailed specification shall be strictly adhered to, supplemented by relevant provisions of Indian standard specifications, the code of practice; etc., The Indian standard specification, National Building Code and the code of practice to be followed shall be the latest versions of those listed in the detailed technical specifications. Any class of work, not covered by the detailed technical specifications, shall be executed in accordance with the instructions and requirements of the Chairman, Department of Civil Engineering and the relevant provisions of the Indian standard specifications.

Clause 10. Alteration in quantity of work, specifications and designs, Additional work, deletion of work

The Chairman, Department of Civil Engineering shall have power to make any alternations in, omissions from additions to or substitutions for the original specification, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work. For that purpose or if for any other reason it shall in his opinion be desirable, he shall have power to order the Contractor to do and the contractor shall do any or all the following: -

- a) Increase or decrease the quantity of any work included in the contract.
- b) Omit any such work.
- c) Change the character or quality or kind of any such work,
- d) Change the levels, lines, positions and dimensions of any part of the work,
- e) Execute additional work of any kind necessary for the completion of the works and
- f) change in any specified sequence, methods or timing of construction of any part of the work.

Contractor bound by Chairman, Department of Civil Engineering's instructions

The Contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Chairman, Department of Civil Engineering or other competent authority and such alteration shall not in any way vitiate or invalidate the contract.

Standard Quantity Take-off (SQT)

Contractor within **14 days** of Issue of LOI to submit the Project Manager & seek approval for the Standard quantity Take-off sheets for all the items mentioned in the Tender BOQ, after due referencing the Tender/ GFC drawings and the Technical Specification. Upon approval, the SQT shall remain the base document for initiating any change orders/ variation in accordance to Clause 31, tracking the daily project progress, and for the measurement sheets.

Orders for variations to be in writing

1. No such variations shall be made by the Contractor without an order in writing of the Chairman, Department of Civil Engineering; provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is the result of the quantities exceeding or being less than those stated in the 'Schedule B' provided also that if for any reason the Chairman, Department of Civil Engineering shall consider it desirable to give any such order verbally, the Contractor shall comply with such order without any confirmation in writing of such verbal order given by the Chairman, Department of Civil Engineering, whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of the clause; provided further that if the Contractor shall within seven days confirm in writing to the Chairman, Department of Civil Engineering and if such confirmation is not contradicted in writing within fourteen days by the Chairman, Department of Civil Engineering, it shall be deemed to be an order in writing by the Chairman, Department of Civil Engineering.
2.
 - a) Any additional 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 same conditions in all respects on which he agreed to do the main work and same rates as are specified in the tender for the main work. However, change in the Undertaking rates tendered and accepted shall be considered in respect of items under which the quantity of work performed exceeds tendered quantity by more than 25 percent and this actual change in rate will be restricted only to such excess quantity (i.e. beyond 125 percent of the tendered quantity).

(b) Rate for excess quantity beyond 125 percent of tendered quantity

The Additional quantity which exceeds 125 percent of the tendered quantity shall be paid at the rates entered in or derived from Schedule of Rates prevalent at the time of executing additions and alterations plus or minus the overall percentage of the original tendered rates over the current Schedule of Rates (KPWD) of the year in which the tender is accepted (as per the comparative Statement prepared at the time of acceptance of the tender).

(c) Rates for additional, substituted, altered items of work

If the additional, substituted or altered work includes any class of work for which no rate is specified in the contract, then such work shall be carried out at the rates specified for or derived from similar item of work in the agreement. In the absence of similar items in agreement, rate shall be as specified for or derived from similar items in the schedule of rates of KPWD prevalent at the time of execution of such additional substituted or altered items of works, plus or minus the overall percentage of original tendered rates over the current schedule of rates of (KPWD) the year in which tender is accepted as mentioned in sub clause (b) above. With regard to the question whether the additional, substituted or altered item/items of work/works is / are similar or not, to that/those in the agreement / in the Schedule of Rates of KPWD and the decision of the Department of Civil Engineering shall be final and binding on the contractor.

(d) Determination of rates for items not found in Estimate or Schedule of Rates

If the rates for additional, substituted or altered work cannot be determined in the manner specified in sub **clauses (b) and (c)** above, then the contractor shall within 7 days of the date of receipt by him of the order to carry out the work, inform the Chairman, Department of Civil Engineering of the rates which it is his intention to charge for such class or work, supported by analysis of the rate or rates claimed. Thereupon the Chairman, Department of Civil Engineering shall determine the rate or rates on the basis of observed data and failing this, on the basis of prevailing market rates. Under no circumstances the contractor shall suspend the work on the plea of non- settlement of rates for items falling under this clause. In the event of any dispute regarding the rates for such items the decision of Chairman, Department of Civil Engineering, shall be final.

Working out the data rates for non-SR/ non tendered items shall be based on the procedures laid down in the standard rate analysis format of KPWD Bangalore circle Bangalore. The data rates shall be approved by the Chairman, Department of Civil Engineering, and shall be binding on the contractor.

Clause 11. TIME LIMITS UNFORSEEN CLAIMS

Under no circumstances whatever shall the contractor be entitled to any compensation from Institute on any account unless the contractor shall have submitted claim in writing to the Chairman, Department of Civil Engineering or other competent authority within 30 days of the cause of such claim occurring.

Clause 12. NO CLAIM TO ANY PAYMENT OR COMPENSATION FOR DELETION OF WHOLE OR PART OF WORK

- (a) If at any time after the execution of the contract documents, the Chairman, Department of Civil Engineering or other competent authority shall, for any reason whatsoever, require the whole or any part of the work as specified in the tender, to be stopped for any period or require the whole or part of the work (i) not to be carried out at all or (ii) not to be carried out by the tendered contractor, he shall give notice in writing of the fact to the contractor who will thereupon suspend or stop the work totally or partially as the case may be. In any such case, except as provided hereunder, the contractor shall have no claim to any payment of 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 so derive in consequence of the full amount of the work not having been carried out, or

on account of any loss that he may be put on account of materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions, which may involve any curtailment of the work, as originally contemplated.

(b) Payment for materials already purchased or ordered by contractor.

Where, however, materials have already been purchased or agreed to be purchased by the contractor before receipt by him the said notice the contractor shall be paid for such materials, at the rates determined by the Chairman, Department of Civil Engineering or other competent authority provided they are not in excess of requirements and are of approved quality, and/or shall be compensated for the loss, if any, that he may be put to, in respect of materials agreed to be purchased by him, the amount of such compensation to be determined by the Chairman, Department of Civil Engineering or other competent authority whose decision shall be final.

(c) Labour charges during stoppage of work

If the contractor suffers any loss on account of his having to pay labour charges during the period during which the stoppage of work has been ordered under this clause, the contractor shall on application, be entitled to such compensation on account of labour charges as the Chairman, Department of Civil Engineering or other competent authority, whose decision shall be final, may consider reasonable. Provided that the contractor shall not be entitled to any compensation on account of labour charges if in the opinion of the Chairman, Department of Civil Engineering or other competent authority, the labour could have been employed in the same locality by the contractor for the whole or part of the period during which the stoppage of the work has been ordered as aforesaid.

(d) Time limit for stoppage of work

The period of stoppage ordered by the Chairman, Department of Civil Engineering or other competent authority should not ordinarily exceed six months. Thereafter the portion of works stopped may be treated as deleted from this agreement if a notice in writing to that effect is given to the Chairman, Department of Civil Engineering or other competent authority by the contractor within seven days after the expiry of the above period.

Execution of work deleted:

The portion of work thus deleted may be got executed from the same contractor on supplemental agreement on mutually agreed rates, which shall not exceed current Schedule of Rates plus or minus tender percentage.

Clause 13. ACTION AND PENALTY IN CASE OF BAD WORK

If at any time before the security deposit is refunded to the contractor, it shall appear to the Chairman, Department of Civil Engineering or other competent authority that any work has been executed with unsound, imperfect or unskilful workmanship or with materials of inferior quality, or that any materials or articles provided by him for the

execution of the work are unsound or of a quality inferior to that contracted for, or are otherwise not in accordance with the contract, it shall be lawful for the Chairman, Department of Civil Engineering or other competent authority to intimate this fact in writing to the contractor and then notwithstanding the fact that the work, materials or articles complained of may have been paid for, the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified on whole or in part as the case may require, or if, so required shall remove the materials or articles at his own charge and cost and in the event of his failing to do so within a period to be specified by the Chairman, Department of Civil Engineering or the competent authority in the written intimation aforesaid, the contractor shall be liable to pay a penalty not exceeding one percent on the amount of the estimate for every day not exceeding ten days during which the failure, so continues and in the case of any such failure the Chairman, Department of Civil Engineering or other competent authority may rectify or remove, and re-execute the work or remove and replace the materials or articles complained of, as the case may be at the risk and expense in all respects of the contractor should the Chairman, Department of Civil Engineering or other competent authority for any valid reasons consider that any such inferior work or materials as described above is to be accepted or made use of, it shall be within his discretion to accept the same at such reduced rates he may fix thereof.

Clause 14. WORK TO BE OPEN TO INSPECTION - CONTRACTOR OR RESPONSIBLE AGENT TO BE PRESENT

(a) All works under or in course of execution or executed in pursuance of the contract shall at all time be open to the inspection and supervision of the Chairman, Department of Civil Engineering or other competent authority and his Engineer-in-charge, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Chairman, Department of Civil Engineering or other competent authority Chairman, Department of Civil Engineering, IISc to visit the work shall have been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for the purpose. Orders given to the contractor duly authorized agent shall be considered to have the same force and effect as if they had been given to the contractor himself.

(b) Employment of Minimum Technical Staff

The Contractor shall employ the following technical staff during execution of this work:

- a) One qualified Graduate Engineer & One qualified Diploma Engineer, when the cost of the work to be executed up to 1 Crore,
- b) Two qualified Graduate Engineer & Three qualified Diploma Engineer, when the cost of the work to be executed from 1 Crore to 10 crores;
- c) Three qualified Graduate Engineer & Six qualified Diploma Engineer, when the cost of the work to be executed above 10 crores;
- d) In addition to (i) and (ii) above, the contractor shall employ different types of such technical personnel as may be required and sufficient for execution of work and directed by the Chairman, Department of Civil Engineering to ensure efficient execution of work.
- e) The technical staff so employed, should be available at site whenever required by Engineer in-charge to take instructions.

- f) If the contractor fails to employ the technical staff as aforesaid, he shall be liable to pay a sum of Rs. 25000 (Rupees Twenty thousand only) for each month of default in the case of Graduate Engineers and Rs. 15000 (Rupees Ten thousand only) for each month of default in case of Diploma Holders.
- g) If the Contractor himself possesses the required qualification and is available at the site for receiving instructions from the Chairman, Department of Civil Engineering and other competent authority vide **sub-clause (a)** above it will not be necessary for the technical staff to be available at site for receiving instructions.

Clause 15. NOTICE TO BE GIVEN BEFORE WORK IS COVERED UP

The contractor shall give not less than five days' notice in writing to the Chairman, Department of Civil Engineering or his Chairman, Department of Civil Engineering, IISc in charge of the work before covering up or otherwise placing beyond the reach of the measurement any work in order that the same may be measured; and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement, and shall not cover up or place beyond the reach of measurement, and work without the consent in writing of the Chairman, Department of Civil Engineering or other competent authority or his Chairman, Department of Civil Engineering, IISc in charge of work; and if any work shall be covered up or placed beyond the reach of measurement, without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expense, and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

Clause 16. CONTRACTOR LIABLE FOR DAMAGE DONE, AND FOR IMPERFECTIONS FOR TWELVE MONTHS AFTER CERTIFICATE OF COMPLETION

If the Contractor or his workmen or servants shall break, deface, injure or destroy any part of a building in which they may be working, or any building, road fence, enclosure or grassland or cultivated ground contiguous to the premises on which the work or any part thereof is being executed, or if any damage shall be done to the work, while it is in progress from any cause whatever or if any imperfections become apparent in it within Twelve months of the grant of a certificate of completion, final or otherwise, by the Chairman, Department of Civil Engineering or other competent authority the contractor shall make good the same at his own expenses, or in default the Chairman, Department of Civil Engineering or other competent authority may cause the same to be made good by other workmen, and deduct the expenses (of which the certificate of the Chairman, Department of Civil Engineering or other competent authority shall be final) from any sums that may be due or may thereafter become due to the contractor, or from his Security Deposit or the proceeds of sale thereof, or of a sufficient portion thereof.

The Defects liability period shall be extended for as long as defects remain to be corrected. Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Institute.

Clause 17. CONTRACTOR TO SUPPLY PLANT, LADDERS, SCAFFOLDINGS, ETC., AND IS LIABLE FOR DAMAGES ARISING FROM NON-PROVISION OF LIGHT, FENCING ETC

The contractor shall supply at his own cost all materials, plant, tools, appliance, implements, ladders, scaffolding, and temporary works required for the proper execution of the work whether in the original, altered or substituted form and whether included in the specification, or other documents forming part of the contract or referred to in these conditions or not, and which may be necessary for the purpose of satisfying or complying with the requirements of the Chairman, Department of Civil Engineering or other competent authority as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore, to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or the materials. Failing this, the same may be provided by the Chairman, Department of Civil Engineering or other competent authority at the expense of the contractor and expense may be deducted from any money due to the contractor under the contract or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof. The contractor shall provide necessary fencing and lights required to protect the public from accident, and shall also be bound to bear the expense of defense of every suit, action or other legal proceedings, that maybe brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any suit, action or proceedings to any person, or which may with the consent of the contractor be paid for compromising any claim by any such person.

Clause 18. Measures for prevention of fire

The contractor shall not set fire to any standing jungle, trees, brushwood or grass without a written permit from the Chairman, Department of Civil Engineering. When such permission is given, and also in all cases when destroying cut or dug up trees, brushwood grass, etc., by fire the contractor shall take necessary measures to prevent such fire spreading to or otherwise damaging surrounding property.

Clause 19. Liability of contractor for any damages done in or outside work Area.

Compensation for all damages done by contractor or his men whether in or beyond the limits of Institute property including any damage caused by spreading of fire mentioned in Clause 18 shall be estimated by the Chairman, Department of Civil Engineering and the estimate of the Chairman, Department of Civil Engineering, subject to the decision of the Centre for Campus Management and Development on appeal shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demand failing which the same will be recovered from the contractor as the damages in the manner prescribed in clause 1(c) or deducted by the Chairman, Department of Civil Engineering or other competent authority from any sums that may be due or become due from Institute to the contractor under this contract or otherwise.

The contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any person for injury sustained by him owing to neglect of precautions to prevent the spread of fire and shall pay any damages and cost that may be awarded by the court in consequence.

Clause 20. Work on Notified Holiday

No work shall be done on any notified holiday without the sanction in writing of the Chairman, Department of Civil Engineering or other competent authority.

Clause 21. WORK NOT TO BE SUBLET

- (a) The contract shall not be assigned or sublet by the contractor. However, any specific portion of the work which is of a specialized nature and normally not executable by a general contractor could be got done by the specialized agencies which are executing such works, after obtaining the specific approval of the Chairman, Department of Civil Engineering in writing in each case. Such consent to sublet the work, if given, shall not relieve the contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor or his agents, servants or workmate as fully as if they were the acts, defaults or neglects of the contractor, his agents, servants or workmen.

Consequences of subletting work without approval, becoming insolvent, bribing etc., by contractor and action against the contractor.

If the contractor shall assign or sublet his contract or any portion thereof without the specific approval of the Chairman, Department of Civil Engineering or attempts to do so or become insolvent or commence any proceedings to get himself adjudicated as insolvent or make any composition with his creditors or attempts so to do or if any bribe, gratuity, or indirectly be given, promised or offered by the contractor or any of his servants or agents to any officer or person in the employ of Institute in any way relating to his office or employment or if any such officer or person in the employment or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Chairman, Department of Civil Engineering or other competent authority may thereupon by notice in writing rescind the contract and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Institute and the same consequences shall ensure as if the contract had been rescinded under Clause 3 here of and in addition, the contractor shall not be entitled to recover or be paid for any work actually performed under contract.

- (b) **Recovery of excess payments based on excess measurements and action against contractor.**

Whenever it is noticed that excess payments have been made to the contractor based on excess measurements recorded by the Chairman, Department of Civil Engineering, IISc in the measurement book and countersigned by the contractor or his duly authorized agent, action shall be taken to recover the excess payments together with interest immediately. Action may also be taken to remove the name of the contractor from the approved list of contractors and also to blacklist him.

Change in classification of excavations accepted not permitted.

Once the measurements mentioning the classification of the excavations are recorded in the measurement book and the same is signed by the contractor or his authorized agent in token of acceptance, no request for reclassification by the contractors shall be entrained.

(c) **Criminal proceedings against IISc Officer and Contractor for the lapses.**

Institute also reserve the right to initiate criminal proceedings against the concerned Institute Officers who are directly responsible for the lapse and the contractors who have colluded with the officers of the Institute in the lapse and fraudulently received amounts not due to them legitimately.

Clause 22. SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDERED AS REASONABLE COMPENSATION WITHOUT REFERENCE TO ACTUAL LOSS.

All sums payable by a contractor by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied for the use of Institute without reference to the actual loss or damage sustained and whether any damage has or has not been sustained.

Clause 23. SETTLEMENT OF DISPUTES -TIME LIMIT FOR DECISION

- (a) If any dispute or difference of any kind whatsoever were to arise between the Chairman, Department of Civil Engineering and the contractor regarding the following matters namely,
- (i) The meaning of the specification's designs, drawing and instructions herein before mentioned,
 - (ii) The quality of workmanship or materials used on the work and
 - (iii) Any other question, claim right, matter, thing whatsoever, in any way arising out of or relating to the contract, designs, drawings, specification, estimates, instructions, or orders, or those conditions, failure to execute the same whether arising during the progress of the work, or after the completion, termination or abandonment thereof, the dispute shall, in the first place, be referred to the Centre for campus management and Development who have jurisdiction over the work specified in the contract. The Centre for campus management and Development shall within a period of fifteen days from the date of being requested by the Contractor to do so give written notice of its decision to the Contractor.

If the decision of the Centre for campus management and Development is not acceptable to the contractor, he may approach the **Director, IISc within** a period of 15 days for settlement.

(b) **Director, IISc decision's final.**

Subject to other form of settlement hereafter provided, the Director's decision in respect of every dispute or difference so referred shall be final binding upon the contractor. The said decision shall forthwith be given effect to and contractor shall proceed with the execution of the work with all due diligence.

(c) **Remedy when Director's decision is not acceptable to contractor.**

In case the decision of the Director is not acceptable to the contractor, he may approach the Law Court at Bangalore for settlement of dispute after giving due written notice in this regard to the Director within a period of ninety days from the date of receipt of the

written notice of the decision of the Director. Further, the Bangalore courts alone shall have the exclusive jurisdiction.

(d) Time limit for notice to approach Court of law by contractor

If the Director has given written notice of his decision to the contractor and no written notice to approach the law court has been communicated to him by the contractor within a period of ninety days from receipt of such notice, the said decision of Director shall be final and binding upon the contractor.

(e) Time limit for notice to approach law court by contractor when decision is not given by Director, IISc as at (b).

If the Director fails to give notice of his decision within a period of ninety days from the receipt of the contractor's request in writing for settlement of any dispute or difference as aforesaid, the Contractor may within ninety days after the expiry of the first named period of ninety days approach the Law Courts at Bangalore giving due notice to the Director.

(f) Contractor to execute and complete work pending settlement of dispute.

Whether the claim is referred to the Director or to the Law Courts, as the case may be, the contractor shall proceed to execute and complete the works with all due diligence pending settlement of the said dispute or differences.

(g) Obligations of the Chairman, Department of Civil Engineering and contractor shall remain unsettled during considerations of dispute.

The reference of any dispute or difference to the Director or the Law Court may proceed notwithstanding that the works shall then be or be alleged to be complete, provided always that the obligations of the Chairman, Department of Civil Engineering and the contractor shall not be altered by reason of the said dispute or difference being referred to the Director or the Law Court during the progress of the works.

Clause 24. CONTRACTOR TO PAY COMPENSATION UNDER WORKMEN'S COMPENSATION ACT.

(a) The contractor shall be responsible for and shall pay any compensation to his own workmen payable under the relevant Workmen's Compensation Act for injuries caused to the workmen. If Institute pays such compensation on behalf of the contractor it shall be recoverable by Institute from the contractor under as per relevant clauses.

(b) Contractor to pay expenses of providing medical aid to workmen.

The contractor shall be responsible for and shall pay the expenses of providing medical aid to any workman who may suffer a bodily injury as a result of an accident. If Institute incurs such expenses, the same shall be recoverable from the contractor forthwith and be deducted without prejudice to any other remedy of Institute, from any amount due or that may become due to the contractor.

Clause 25. CONTRACTOR TO PROVIDE PERSONAL SAFETY EQUIPMENT FIRST AID APPARATUS, TREATMENT etc.

The contractor shall provide all necessary personal safety equipment and first aid apparatus for the use of the persons employed on the site and shall maintain the same in good condition suitable for immediate use, at any time and shall comply with the following regulations in connection therewith: -

- The worker will be required to use the equipment so provided by the contractor and the contractor shall take adequate steps to ensure proper use of the equipment by those concerned.
- When work is carried on in proximity to any place where there is a risk of drowning; all necessary steps shall be taken for the prompt rescue of any person in danger.
- Adequate provision shall be made for prompt first - aid treatment of all injuries likely to be sustained during the course of the work.

Clause 26. Minimum Age of Person Employed by Contractor

(a): No contractor shall employ

- Any person who is under age of 18 years.
 - Who does not produce a valid certificate of vaccination against epidemic diseases in respect of himself/ herself as well as all the members of his/her family.
- (b) The contractor shall provide potable water facilities to the workers. Similar amenities shall be provided to the workers engaged on large works in urban area.
- (c) Removal of persons not satisfying conditions (a) (i) & (ii)

The Chairman, Department of Civil Engineering or other authority is authorized to direct the removal or to remove through - his own agency, from the work any person referred to in sub-clauses (a) above not satisfying these conditions and no responsibility shall be accepted by the Institute for any delay caused in the completion of the work by such directions for removal.

- (d) Payment of fair and reasonable wages by contractor.

The contractor shall pay fair and reasonable wages, which shall not be less than the minimum wages fixed by Govt. of India from time to time to the workmen employed by him in the contract undertaken by him. In the event of any dispute arising between the contractor, and his workmen on the ground that the wages paid are not fair and reasonable the dispute shall be referred without delay to the Chairman, Department of Civil Engineering or other competent authority, who shall decide the same. The decision shall not in any way affect the conditions in the contract regarding the payment to be made by Institute at the agreed tender rates.

Clause 27. CONTRACTOR NOT ENTITLED TO ANY CLAIM OR COMPENSATION FOR DELAY IN EXECUTION OF WORK IN BORROW PITS.

The contractor shall not be entitled to claim compensation if there is any delay in the execution of the work on account of water standing in borrow pits and Compartments. The rates are inclusive for hard or cracked soil, excavation in mud, sub-soil water or

water standing in borrow pits and no claim for extra rate shall be entertained, unless otherwise specified.

Clause 28. METHOD OF PAYMENT OF BILLS

Payment to contractors shall be made by RTGS by the Institute.

Clause 29. SET OFF AGAINST ANY CLAIM OF INSTITUTE

Any sum of money due and payable to the contractor (including the security deposit refundable to him) under this contract may be appropriated by the Institute and set off against any claim of Institute in respect of a payment of a sum of money arising out of or under any other contract made by the contract with the Institute.

Clause 30. RATES INCLUSIVE OF SALES TAX AND LABOUR CESS AND ROYALTY

- (a) The rates to be quoted by the contractor shall be inclusive of all taxes like GST , Labour cess, Royalty etc., No extra payment on this account will be made to the contractor.
- (b) When there is a change in existing taxes from time to time i.e. upward or downward is admissible accordingly
- (c) All quarry fees, octroi dues levied by the state or any local body or authority and ground rent, if any, charged by the Chairman, Department of Civil Engineering for stacking materials should be paid by the contractor.

Clause 31. IMPORTANCE OF SAFETY

In addition to Contractor's Contractual Obligations on Safety as per the relevant clauses stated, The Contractor shall comply with all safety standards to the satisfaction of the Employer's Representative.

In respect of all labour, directly or indirectly employed on the project for the performance and execution of the Contractor's Work under the Contract, the Contractor shall at its own expense arrange for all the safety provisions as listed in (i) Safety codes of C.P.W.D. and Bureau of Indian Standards, (ii) The Electricity Act, (iii) The Mines Act, and Regulations, Rules and Orders made there under and such other acts as applicable. Precautions as stated in the safety clause are the minimum necessary and shall not preclude the Contractor taking additional safety precautions as may be warranted for the particular type of work or situations. Also mere observance of these precautions shall not absolve the Contractor of his liability in case of loss or damage to property or injury to any person including but not limited to the Contractor's labour, the Employer's, Architect's, Employer's Representative's and Project Manager's representatives or any member of the public or resulting in the death of any of these.

The Contractor shall institute and implement to the satisfaction of the Project Manager a construction safety programme, including:

- 1 Preparing a Site-specific written safety programme consistent with the EHS Plan, Indian law and best practices. As a minimum, the programme shall require applicable safety equipment for all workers, use of barriers and barricades around potentially

dangerous areas, protection of workers working under elevated conditions, accident reporting, first aid provisions etc.

2 Weekly safety reviews and 'risk assessments' shall be carried out in conjunction with the Project Manager and the Employer in order to identify potential safety hazards and to mitigate against them.

3 Attending weekly or as scheduled safety meetings at site conducted by the site safety representative of project manager

4 The Contractor will be required to provide all personnel entering the Site an Identity and safety rules card and verbal explanation of the safety programme.

5 Requiring all Sub-Contractors and other workers under the responsibility of the Contractor (including the Vendors or later phases of the construction of the Project) to adhere to the written safety programme as per approved format.

Experienced safety officers with adequate number of supporting personnel shall be appointed by the Contractor for full time on the site during the Contract period.

NON-COMPLIANCE OF REGULATIONS

If the Project Manager or the Employer's Representative notifies the Contractor of non-compliance with the foregoing regulations, the Contractor shall immediately, if so directed, or in any event not more than eighteen (18) hours after receipt of such notice, make all reasonable efforts to correct such non-compliance. If the Contractor fails to do so, the Employer may suspend all or any part of the Work. When the Contractor has undertaken satisfactory corrective action, Employer shall lift the suspension of the Work. The Contractor shall not claim any extension of time to complete the Work or additional fees due to any such work suspension.

The Client reserves the right to levy penalty if the safety norms such as not wearing helmets, safety gloves/belts/shoes/jackets. etc., even after a written notice by the enforcing authority, a penalty of Rs. 10,000/- per day per event or till the safety norms are adhered to in addition to stopping of work till the safety norms are adhered

Clause 32 Refund of Security Deposit (EMD & FSD):

The Security Deposit lodged/paid by a Contractor shall be refunded to him after the final bill is paid or after the successful completion of defect liability period, during which period the work should be maintained by the Contractor in good order, whichever is later.

Clause 33 BAR CHART / CPM CHART:

BAR chart / CPM chart shall be produced during agreement by the contractor. According to the bar chart work is to be executed otherwise penalty will be levied for the delay of work.

THE ARTICLES OF AGREEMENT

This Agreement is made at Bangalore, on this **XXth day of MONTH** in the year **TWO THOUSAND AND TWENTY THREE (XX.XX.2023)**.

BY AND BETWEEN

INDIAN INSTITUTE OF SCIENCE herein referred as IISc, a Trust registered under the Charitable Endowments Act, 1890, a deemed University and an autonomous Institution funded by the Ministry of Education, Government of India having its office at **Sir C.V Raman Road, Malleswaram, BANGALORE 560 012**, represented by the **Registrar IISc**, Bangalore (hereinafter referred to as the IISc which expression shall unless repugnant to the context or meaning thereof, mean and include its successors in interest, trustees and permitted assigns) of the ONE PART

AND

M/s xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx Bangalore - 56003xx, hereinafter referred to as the "CONTRACTOR", (which expression shall unless repugnant to the context or meaning thereof, mean and include their partners, their respective heirs, executors, administrators and assigns) on the OTHER PART.

RECITALS

A. WHEREAS the IISc is desirous of getting the work of

"Fire Structural Testing Facility at

Indian Institute of Science,
Challakere campus at Khudapura,
Challakere, Chitradurga District,
Karnataka - 577 536"

(hereinafter called the work) executed by the Contractor at the rates quoted by him amounting to Rs. xxxxxxxx (Rupees xxxxxxxxxxxxxxxxxxxxxxxxxxx only) Inclusive of all Taxes which is xxx% Above/Below the estimated amount put to tender.

B. WHEREAS the Contractor has agreed to execute the aforesaid work on terms and conditions mentioned herein and subject to Tender Conditions of Contract and in accordance with the particular specifications, general notes and the schedule of quantities, schedule of rates, payment, and penalty condition, to the satisfaction of the IISc, Bangalore

NOW THIS AGREEMENT WITNESSETH AND THE PARTIES HERETO AGREE AND SOLEMNLY AFFIRM AS FOLLOWS:

1. In consideration of the payment to be made to them as hereinafter provided, the contractor shall, subject to the terms, conditions, specifications, schedule of quantities, drawings, etc., more particularly stated in the Schedules aforesaid, execute and complete the work within **150 days** with priority on furnace building and control cabin room within 60 days to be ready for third party commissioning of required facilities for testing, for the work after 10 days of issuance of work order or from the date of handing over of site, whichever is later.

2. IISc shall pay to the contractor such sums as shall become payable hereunder at the time and in the manner specified in the conditions contained in the schedule aforesaid.

3. The time allowed for carrying out the work as entered in the tender Agreement shall be strictly observed by the contractor and shall be deemed to be the essence of the contract on the part of the contractor and shall be reckoned from 10 days after the date on which the work order to commence the work is issued to the Contractor or the date of handing over of site, whichever is later. The work shall throughout the stipulated period of the contract be proceeded with all due diligence and the Contractor shall pay compensation an amount equal to one percent, or such smaller amount, as the Director, Indian Institute of Science (whose decision shall be final) may decide on the amount of estimated cost of the whole work as shown in the tender for every day that the work remains un-commenced or unfinished, after scheduled dates.

4. The contractor shall ensure good progress during the execution of the work be bound in all cases in which the time allowed for any work exceeds one month (save for special jobs) to complete Mile stone-1 i.e.15% of the whole work before the time allowed under the contract has elapsed, Mile stone-2 35% of the work before the time has elapsed, Mile stone-3 60% of the work before the time has elapsed, Mile stone-4 80% of the work before of the time has elapsed, 100% of the work before completion of such time has elapsed.

However, for special jobs if a time schedule has been submitted by the contractor and the same has been accepted by the Chairman, Department of Civil Engineering, the contractor shall comply with the said schedule. In the event of the Contractor failing to comply with the conditions he shall be liable to pay as compensation an amount equal to one percent or such smallest amount, as the Director, Indian Institute of Science (Whose decision in shall be final), may decide on the said estimated cost of the whole work for every day that the due quantity of work remains incomplete; provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed seven and a half (10%) percent of the estimated value of the contract as shown in the tender, provided further that in the event of contractor making up the short fall in progress within the stipulated or extended time of completion, the penalty so recovered may be refunded on an application in writing by the Contractor.

5. The Engineer in charge shall review the progress of all works with the contractor once every week. Such a review shall take into account the programme fixed for the previous week, obligations on the part of the Institute for issue of drawings etc., and also the obligations on the part of the Contractor. The review shall also examine the accumulated delays by the contractor if any and mitigation measures proposed by the contractor to overcome the delay. In case the progress achieved falls short by more than 25 percent of the cumulative programme, the reasons for such shortfall shall be examined and a record made thereof apportioning the responsibilities for the delay between the IISc and the contractor. This record should be signed in full and dated both by the Chairman, Department of Civil Engineering, IISc and the Contractor.

6. The Director, Indian Institute of Science, without prejudice to its rights under the contract in any respect of any delay or inferior workmanship or otherwise, or to any claim for damages in respect of any breaches of the Contract and without prejudice to any rights of remedies under any of the provisions of this contract or otherwise and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases: -

- (i) If the contractor having been given by the Chairman, Department of Civil Engineering a notice in writing to rectify reconstruct or replace any defective work or that the work is

being performed in any inefficient or otherwise improper or unworkmanlike manner, shall omit to comply with the requirements of such notice for a period of seven days of such notice thereafter or if the contractor shall delay or suspend the execution of the work so that in the judgment of the Chairman, Department of Civil Engineering (which shall be final and binding) either they will be unable to secure completion of the work by the date for completion of the work or they had already failed to complete the work by that date.

- (ii) If the Contractor being a company passes a resolution or if the Court passes an order to wind up the company or if a receiver or a manager is appointed on behalf of the creditors of the company or under circumstances which entitles the Court or the creditors to appoint a receiver or manager which would entitle the Court to make a winding-up order.
- (iii) If the Contractor commits breach of any of the terms or conditions of this contract.
- (iv) If the contractor assigns or sublets without written approval of the Chairman, Department of Civil Engineering or becomes insolvent.

The Director of the Institute shall have following powers:

- a) To determine or rescind the Contract as aforesaid (in which termination or recession notice in writing to the Contractor underhand of the Chairman, Department of Civil Engineering shall be conclusive evidence). Upon such determination or recession the security deposit of the Contractor shall be liable to be forfeited and shall absolutely be at the disposal of Institute.
- (2) To employ labor paid by the Institute and supply materials to carry out the work or any part by debiting the Contractor with the cost of the labor and the price of the materials (of the amount of which cost and price certified by the Chairman, Department of Civil Engineering shall be final and conclusive against the Contractor) and crediting him with the value of the work done in all respect on the same manner and at the same rates as if it has been carried out by the contractor under the term of his contract. The certificate of the Chairman, Department of Civil Engineering as to the value of the work done shall be final and conclusive against the contractor, provided always that action under the sub-section shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the Institute are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the Contractor.
- (3) After giving notice to the contractor to measure up the work of the contractor and to take such part thereof as shall be un-executed out of their hands and to give it to another contractor to complete in which case any expenses which may be incurred in excess a sum of 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 Chairman, Department of Civil Engineering shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any monies due to him from the Institute under this contract or any other account whatsoever, of from his security deposit or the proceeds of sales thereof, or a sufficient part thereof as the case may be.

In the event of any one or more of the above courses being adopted by the Chairman, Department of Civil Engineering, the contractor shall have no claim to compensation for any loss sustained by them by reason of having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case of action is taken

under any of the provisions, aforesaid, the contractor shall not be entitled to recover or be paid any sum for work thereto/for actually performed under this contract unless the Chairman, Department of Civil Engineering has certified in writing the performance of such work and the value payable in respect thereof and they shall only be entitled to be paid the value so certified.

7. The schedules above mentioned include the General Rules and Directions to Contractors and the following documents, viz.,
 - i) Letter of Intent
 - ii) Letter of Acceptance
 - iii) Work Order
 - iv) Conditions of Contract
 - v) Contractor's Bid – Bill of Quantities
 - vi) Technical Specifications
 - vii) Drawings
 - viii) The pre-Bid meeting proceedings and corrigendum
 - ix) Any other document listed in the Contract Data as forming part of the contract shall form an integral part of the agreement and the decision of the Chairman, Department of Civil Engineering in reference to all matters of a dispute as to material and workmanship shall be final and binding on both the parties.
8. The IISc reserves the right of altering the drawings of the works and of adding to or omitting any item of work from or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not violate this agreement.
9. This agreement comprises the work aforesaid, and all subsidiary works connected therewith even though such works may not be shown on the schedule appended hereto.
10. In the event the contractor or their employees, agents, sub-contractors deface or destroy the property or the establishment belonging to IISc, the same shall be made good by the contractor at their own expenses.
11. The Contractor shall ensure cleanliness at the premises of IISc ensure cleaning of site and removal of debris every week. In any event the contractor ceases to comply the foregoing the IISc shall ensure the site cleaned at the expense of the contractor.
12. The Contractor shall at all time be responsible for the safety of their employees, agents, sub-contractors, and in any event during the commission of work or in their due course of work the IISc shall not be held responsible. The contractor shall defend, indemnify and hold the Institute harmless from any liability or damage, law suits, penalties imposed by any State or Central Government or statutory body or by a third party for reasons of violation of any of statutory provisions or requirements by the contractor.
13. The Contractor shall adhere to the working conditions and its scope strictly and any act not in confirmation with the scope of work which is mutually accepted by both the parties shall only be done after prior approval and acceptance in writing by the Director.
14. The Contractor shall at any time be responsible for the completion of work in time, also the contractor shall be responsible to submit the final bill within one month after completion of the work.
15. Notwithstanding anything contained in the tender submitted by the contractor, all the clauses of this agreement shall be binding on both parties.
16. Where counter-terms and conditions, printed or copied, are offered by the contractor, the same shall not be deemed to have been accepted by the IISc, unless specific written acceptance thereof is furnished by the IISc. Notwithstanding the foregoing, no verbal agreement or inference from a conversation with any office

- members/representatives/employees of the IISc before, during, or after the execution of the agreement, shall in any way affect or modify any of the terms/obligations contained herein.
17. In the event the contract is terminated by the IISc due to any aforementioned act/omission on the part of the contractor, or for any reason whatsoever, the IISc shall be entitled to engage the services of any other person, agency or Contractor to meet its requirement, without prejudice to its rights including claim for damages against the Contractor.
 18. This agreement can be terminated by IISc with the prior written notice of Seven (7) days in the event of a breach of any of its terms of this agreement and even otherwise this Agreement may be terminated by IISc by giving a minimum of 7 days prior written notice to the Contractor.
 19. The IISc shall be indemnified for all losses due to commissions and omissions of persons deployed by the contractor. If any loss or damage is caused to the IISc on account of any negligence, carelessness, acts of omissions. commissions of contractors, its employees or staff, the same shall be made good by the contractor. The contractor shall defend, indemnify and hold the Institute harmless from any liability or damage, law suits, penalties imposed by any State or Central Government or statutory body or by a third party for reasons of violation of any of statutory provisions or requirements by the contractor. The IISc shall not be liable for any damage or compensation payable to any workmen or to any person as a consequence of this work and the IISc shall be completely indemnified accordingly.
 20. The contractor shall pay wages directly to its personnel The contractor shall also ensure that no amount by way of commission or otherwise is deducted from the wages of the workmen. The contract labourers deployed by the agency shall not involve in any theft/pilferage/damage to Institute property. After necessary investigations, if proved that the contractor or their personnel are responsible for the incident, the contractor is liable and will be penalized to the extent of the value of the loss and additionally Rs. 50,000/- for each such incident.
 21. All terms and conditions, the scope of work, and other conditions as mentioned in the tender document will be diligently complied by the contractor. The terms and conditions, the scope of work, and other conditions mentioned in the tender documents shall form a part and parcel of this agreement.
 22. The Contractor hereby agrees and affirms that during or subsequent to the performance of the duties under this Agreement, the Contractor shall maintain confidentiality and shall not divulge, communicate, use or appropriate any of the IISc Information, except to the extent necessary for the Contractor to fulfill his obligations or duties to the IISc under this Agreement. The Contractor shall not cause transmission, removal or transfer of tangible embodiments of, or files from the IISc place of business, without the prior written consent of the IISc and shall not disclose any information of the IISc to any third part
 23. In case of disputes including all questions relating to the performance of the obligations under this agreement and all the dispute and differences which shall arise either during or after the agreement period or other matters arising out of or relating to this agreement or payments to be made in pursuance thereof shall be decided by the Director of IISc whose decision shall be binding on the contractor. The Contractor hereby agrees to be bound by the decision of the Director, IISc.
 24. **COURTS:**

Courts of appropriate jurisdiction situated in Bangalore City shall have exclusive jurisdiction. Any dispute or difference arising between the parties to the agreement in relation to any of the matters specified herein, shall be settled in the Courts of appropriate jurisdiction situated in Bangalore City which shall have exclusive jurisdiction in regard to any matter arising under or in relation to this agreement. Laws of India and the State of Karnataka, shall be applicable in this regard

25. **GOVERNING LAW**

This Contract shall be governed by the Law of India for the time being in force

IN WITNESS WHEREOF the parties hereto have set their respective hands the day and the year here in above written.

In the presence of:
Witness 1:

Signed by for and on behalf of the said Contractor.

(Company Name)

In the presence of:
Witness 2:

Signed by for and on behalf of the IISc.

REGISTRAR
INDIAN INSTITUTE OF SCIENCE
BANGALORE-12

MEMORANDUM OF WORK

INDIAN INSTITUTE OF SCIENCE, BANGALORE-12 ITEM RATE TENDER FOR WORK

1.	General Description	Fire Structural Testing Facility at Indian Institute of Science, Challakere campus at Khudapura, Challakere, Chitradurga District, Karnataka - 577 536
2.	Estimated Cost	Rs. 32696923.00
3.	Earnest Money	Rs. 490454.00
4.	Date of Commencement of work	Within ten days from the date of issue of work order or the date of handing over the site whichever is later
5.	Frequency of interim Certificate and payment	Once every month.
6.	Further Security Deposit	6% on the running account bills and final bill in addition to Earnest Money Deposit. When the F.S.D. deducted from the RA bills of the Contractor @ 6% of the bill amount exceeds Rs.1.00 lakhs, the amount in excess of Rs.1.00 lakh may, at the request of the Contractor, be released to him against the production of a bank guarantee issued by a Nationalized Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the period mentioned in page 2 of Sl.No.1.
5.	Time allowed for the completion of work in all respects from the date of commencement of work	150 days with priority on furnace building and control cabin room within 60 days to be ready for third party commissioning of required facilities for testing
6.	Bills Of Quantities.	As per enclosure.
7.	Defects liability period /release of security deposit.	The security deposit lodged/paid by a contractor shall be refunded to him after the final bill is paid or after Twenty Four 24 months from the date of completion of the work, during which period the work so executed should be maintained by the contractor in good order, whichever is later.
8.	Period for payment of Running Bill.	Four weeks from the date of submission of each Running account bill by the Contractor.

9	Period for submitting the final Bill.	One month from the date of virtual completion of the work by the Contractor.
10	Specifications.	The work shall be carried out strictly in accordance with the enclosed specifications and wherever items are not covered by those specifications in accordance with specifications/drawings /designs/requirements and directions of the Chairman, Department of Civil Engineering

I/We, hereby tender for the execution for the Indian Institute of Science, Bangalore-12 of the works specified in the under mentioned memorandum within the time specified in such memorandum at the rates specified therein and in accordance, in all respects, with the specifications, designs, drawings and instructions in writing which have been read by me/read and explained to me and with such materials as provided for by and in all other respects in accordance with such conditions as for as possible.

I/We hereby agree to abide by and fulfill all the terms and provisions of the conditions contained in the articles of agreement, which have been read by me/us or in default thereof to forfeit and pay to the Registrar, Indian Institute of Science or his successors he sums of monies mentioned in the said conditions.

The sum of **Rs. 490454.00 (Rupees Four Lakh Ninety Thousand Four Hundred Fifty Four Only)** has been deposited in cash/bank draft as Earnest Money the full value which is to be absolutely forfeited to the Registrar or his successors in Office should I/We fail to commence the work specified in the above memorandum and complete the same.

Dated this **XX day of XX 2023**.

Signature of the Contractor

Witness to Contractor/s Signature:

NAME

ADDRESS

OCCUPATION

The above tender is hereby accepted by me on behalf of the Indian Institute of Science, Bangalore-12.

**REGISTRAR
INDIAN INSTITUTE OF SCIENCE
BANGALORE.**

Indian Institute of Science, Bangalore-12
A P P E N D I X

1.Name of the work	Fire Structural Testing Facility at Indian Institute of Science, Challakere campus at Khudapura, Challakere, Chitradurga District, Karnataka - 577 536
2.Date of commencement of work	Within Ten days from the date of issue of work order or the date of handing over the site whichever is later
3.Time of Completion	150 days with priority on furnace building and control cabin room within 60 days to be ready for third party commissioning of required facilities for testing
4.Frequency of interim Certificate and payment	Once in every month.
5.Further Security deposit	6% on the running bills and final bill in addition to earnest money deposit. When the F.S.D. deducted from the R.A. Bills of the contractor @ 6% of the bill amount exceeds Rs.1.00 Lakhs, the amount in excess of Rs.1.00 Lakh may, at the request of the contractor, be released to him against the production of bank guarantee issued from a Nationalised /Scheduled Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the defect liability period.
6. Defects liability period / retention amount from the final bill/release of balance of deposit.	The security deposit lodged/paid by a contractor shall be refunded to him after the final bill is paid or after Twenty Four 24 months from the date of completion of the work, during which period the work so executed should be maintained by the contractor in good order, whichever is later.
7. Penalty for delay	In respect of the shortfall in progress, assessed as due to the delay on the part of contractor as per clause 2(b) and 2(c), the contractor shall be liable to pay as penalty an amount equal to one percent of the estimated cost of the balance work assessed according to the programme, for every day that the due quantity of work remains incomplete, provided always that the total amount of penalty to be paid under the provisions of this clause shall not exceed 7 ½ percent of the estimated cost of the entire work as shown in the tender, provided further that in the event of the contractor making up the shortfall in progress within the stipulated or extended time of completion, the penalty so recovered may be refunded on an application in writing by the contractor.
8. Period for payment of Running Bill	Three weeks from the date of submission of each Running account bills by the Contractor.
9. Period for submitting the final Bill	One month from the date of virtual completion of the work by the Contractor.

10. REFERENCES
B.I.S. STANDARDS

Sl.No	STANDARDS	TITLE
	Code of Practice / Guide	
1	IS : 732 – 1989	Code of Practice for Electrical wiring installations.
2	IS : 4648 – 1968	Guide for Electrical layout in residential buildings
3	IS : 80614 – 1976	Code of Practice for Design, installation and maintenance of service lines up to and including 650V.
4	IS : 7752 (Part-1) - 1976	Code of Practice for interior illumination : General requirements and recommendations for welding interiors.
5	IS : 4347 – 1967	Code of Practice for hospital lighting
6	IS : 6665 – 1972	Code of Practice for industrial lighting
7	IS : 2672 – 1966	Code of Practice for Library lighting
8	IS : 10118 (Part-1) - 1982	Code of Practice for selection, installation and maintenance of switcher and Control gear : Installation.
9	IS : 4146 – 1983	Application guide for voltage transformers.
10	IS : 3043 – 1987	Code of practice for earthing.
11	IS : 5216 (Part-2) - 1982	Guide for safety procedures and practices in electrical work : General.
12	IS : 4237 – 1982	General requirements for switchgear and control gear for voltages not exceeding 1000 V AC or 1200 V DC.
13	IS : 6875 - (Part-1) - 1973	Control switches (Switching devices for control and auxiliary circuits including 1000 V AC and 1200 V DC : General requirements and tests.
14	IS : 10027 – 2000	Composite units of Air-Break switches and rewirable type fuses for voltages not exceeding 650 V AC.
15	IS : 4064 (Part-1) - 1978	Composite units of Air-Break disconnecter, Air-Break switch disconnecter and fuse- combination units for voltages not exceeding

		1000 V AC or 120 V DC : General requirements.
16	IS : 8828 – 1996	Electrical accessories - circuit breakers for over current protection for household and similar installation.
17	IS : 2516 (Part-1/Sec01)-1985	Circuit-Breaks : Requirements and tests : Voltages not exceeding 100 V AC or 1200 V DC.
18	IS : 5039 – 1983	Distribution pillars for Voltages not exceeding 1000 V AC or 1200 V DC.
19	IS : 8544 (Part-4) - 1979	Motor starters for voltages not exceeding 1000 V : Reduced voltage AC starters, two- step auto transformer starters.
20	IS : 9537 (Part-1) - 1980	Conduits for electrical installations General requirements
21	IS : 9537 (Part-4) - 1983	Conduits for electrical installations : Pliable self recovering conduits of insulating materials.
22	IS : 3854 – 1997	Switches for domestic and similar purposes.
23	IS : 1293 – 1988	Plugs and sockets outlets of rated voltage up to and including 250 Volts and current up to and including 16 Amperes.
24	IS : 2418 (Part-1) - 1977	Tubular Fluorescent lamps for general lighting services : Requirements and tests.
25	IS : 9900 (Part-1) - 1981	High pressure mercury vapor lamps : Requirements and tests.
26	IS : 1913 (Part-1) - 1978	General and safety requirements for luminaries : Tubular fluorescent lamps.
27	IS : 10322 (Part-1) - 1982	Luminaries : General requirements
28	IS : 302 (Part-1) - 1979	General and safety requirements for household and similar electrical appliances.
29	IS : 6236 – 1971	Direct recording electrical measuring instruments.
30	IS : 2705 (Part-1) - 1992	Current transformers : General requirements.

31	IS : 2448 (Part-1) - 1963	Adhesive insulating tapes for electrical purposes : Tapes with cotton textile substrates.
32	IS: 8130-1984	Code for Conductor Construction
33	IS: 5831-1984	Code for Insulation & sheath material
34	IS:694-1990	PVC insulated Flexible Single Core Wire/ Unarmoured Multicore/ Flat Cables. For working voltage upto & including 1100V.
35	IS:1554(Part-1)-1988	Copper or Aluminium Conductor, PVC insulated, extruded inner sheathed PVC, galvanised steel wire/strip armoured, extruded PVC sheathed LT Control/Power Cable. For working voltage up to & including 1.1KV.
36	IS:3975-1990	Code for Number of Strips in armouring construction.
37	IS: 7098/II/85	XLPE insulated HT & AB Cables. For working voltage 6.35/11KV.
38	IS:14255-1995	Code for Aerial Bunched Cables.For working voltage up to 1.1KV.
39	IS:13573/VDE 0278/IEC 60502/HD 629.1.S2 CENELEC	Code of Type tests for HT termination jointing kit.
40	IS 7569:1987	Cast Acrylic Sheets for use in Luminaires
41	IS 8030:1976	Specifications for Luminaires for Hospitals
42	IS 10242: Part 3: Sec 6: 1986	Electrical installations in ships: Part 3 Equipment, Section 6 Luminaires & accessories
43	IS 10322: Part 2 1982	Specification for Luminaires - Part 2: Constructional Requirements
44	IS 10322: Part 3 1984	Specification for Luminaires - Part 3: Screw & Screw Less Terminals
45	IS 10322: Part 4 1984	Specification for Luminaires - Part 4: Method of Tests
46	IS 10322: Part 5: Sec 1: 2012	Luminaires: Part 5 Particulars requirements, Sec 1 General Purpose Luminaires
47	IS 10322: Part 5: Sec2: 2012	Specifications for Luminaires - Part 5 : Particular Requirements - Section 2: Recessed Luminaires

48	IS 10322: Part 5: Sec4: 1987	Luminaires: Part 5 Particulars requirements, Section 4 Portable general-purpose luminaires
49	IS 13383: Part 1 : 1992	Photometry of Luminaires - Method of Measurement - Part 1: Luminaires for use in interior Lighting
50	IS 13383: Part 2 : 1992	Methods of Photometry of luminaires: Part 2 Luminaires for road & street lighting
51	IS 13383: Part 3 : 1992	Photometry of Luminaires - Method of Measurement - Part 3: Luminaires for Floodlighting
52	BSEN 10025 Grade 5, 355JO (or) ASTM A 572-50	Steel sheet thickness
53	IS 875 Part 3	Wind Velocity
54	IS 2062 (or) ASTM A 572-50	Base Plate
55	BSEN ISO 1461 (or) ASTM A123 (or) IS 2629	Galvanized in single hot dip / With Average 70 Microns
56	BS 5135	Welded Single L-Seam Joint
57	AISI 304 Grade	Stainless Steel Wire Rope (Factor of Safety: TR No. 7)
58	IS 1239	Maximum Load Carrying Capacity (Lantern)
59	IS 9595 (or) IS 10178 AWS	Single Section & Single Joint welded
60	ASTM - A 123 and 153	Hot dip Galvanized in Single dipping with not less than 65 Microns
61	NBC BIS 2016	National Building Code of India 2016 (NBC 2016) Vols I and II

EARTH WORK - IS CODES		
1	IS-1200 (Part 1)	Method of measurement of building and Civil Engineering Works.
2	IS 1200 (Part 1)	Method of measurement of earth work
3	IS 1200 (Part-27)	Method of measurement of earth work (by Mechanical Appliances)
4	IS 4988 (Part IV)	Excavators
5	IS 12138	Earth moving Equipment's
6	IS 3764	Safety code for excavation work
7	IS 4082	Recommendations of stacking and storage of construction materials at site
CONCRETE WORK - IS CODES		

1	IS 383	Specification for coarse and fine aggregate from natural sources for Concrete.
2	IS 456	Plain and reinforced concrete - Code of practice
3	IS 516	Method of test for strength of concrete
4	IS 1199	Method of sampling and analysis of concrete
5	IS 1200 (Part II)	Method of measurement of building and civil engineering work (concrete work)
6	IS 2386	Method of test for aggregates for concrete Part I to Part V
7	IS 4656	Specification for form vibrators for concrete.
8	IS 456	Code of Practices for plain and Reinforced concrete.
9	IS 516	Method of test for strength of concrete.
10	IS 1200 (Part II)	Method of measurement of building and civil engineering work – concrete work
11	IS 1791	Specification for batch type concrete mixes
12	IS 4925	Batch plants specification for concrete batching and mixing plant
13	IS 4926	Ready – Mixed Concrete
14	IS 10262	Recommended guidelines for concrete mix design
15	IS 13311 (Part I)	Indian standard for non-destructive testing of concrete. Method of test for ultrasonic pulse velocity
16	IS 13311	Indian standard for non-destructive testing of concrete. Method of testing by rebound hammer.
STRUCTURAL STEEL WORK - IS CODES		
1	IS 226	Structural steel (Standard quality)
2	IS 800	Code of Practice for use of structural steel in general building construction.
3	IS 801	Code of practice for use of cold formed light gauge steel structural member's in general building construction.
4	IS 806	Code of Practice for use of steel tubes in general building construction.
5	IS 808	Dimension for hot rolled steel sections.
6	IS 813	Scheme of symbols for welding.
7	IS 814	Covered electrodes for metal arc welding of (Part I & II) structural steel.
8	IS 816	Code of practice for use of metal arc welding and general construction in mild steel.
9	IS 822	Code of Practice for inspection of welds.
10	IS 961	Structural steel (high tensile)
11	IS 1120	Coach Screws.
12	IS 1149	Specification for light tensile steel rivet, bars for structural purposes.
13	IS 1161	Steel tubes for structural purposes.
14	IS 1182	Recommended practice for Radiograph examination of fusion welded butt joints in steel plates.
15	IS 1200	Method of measurement in Building Civil Engineering work.
16	IS 1239	Mild steel tubes, tubulars and other wrought steel fittings
17	Part I	Mild Steel

18	Part II	Mild steel tubulars and other wrought sheet pipe fittings.
19	IS 1363	Black hexagonal bolts, nut and black hexagon screws product of Grade C (size range M25 to M64) (Part 1 to 3).
20	IS 1365	Slotted counter sunk screws.
21	IS 1367	Technical supply conditions for threaded fasteners.
22	IS 1977	Structural steel (ordinary quality)
23	IS 2016	Plain washer.
24	IS 2062	Structural steel (fusion welding quality)
25	IS 2595	Code of practice for Radiographic testing.
26	IS 4000	High strength bolts in steel structures Code of practice.
27	IS 4923	Hollow steel sections for structural use.
28	IS 5624	Specification for foundation bolts.
29	IS 6227	Code of practice for use of metal arc welding in tubular structure.
30	IS 7215	Tolerances for fabrication of steel structures.
GI SHEET FIXING		
1	IS 277	Galvanised steel sheets (plain and corrugated)
2	IS 1367 (PT - 13)	Technical supply conditions for threaded steel fasteners pt.13 hot dip galvanized coating on threaded fasteners
3	IS 1200 (PT.IX)	Method of measurements of building and civil engineering works Part - 9 Roof covering (including cladding)
DEMOLISHING WORK		
1.	IS 1200 (Pt - XVIII)	Method of Measurements of Building and Civil Engineering Works (Part -XVIII) Demolition and Dismantling
2.	IS 4130	Demolition of Buildings-

ABBREVIATIONS:

The following abbreviations wherever they appear in the specifications, shall have the meaning or implication hereby assigned to them:

Mm	Millimetre
Cm	Centimetre
M	Metre
Km	Kilometre
Mm /sqmm 2	Square Millimetre
Cm /sqcm 2	Square centimetre
Dm /sqdm 2	Square decimetre
M /sqm 2	Square metre
Cm / cubic cm 3	Cubic centimetre
Dm / cubic dm 3	Cubic decimetre
M3/cum 3	Cubic metre
ml	Millilitre
kl	Kilolitre
Gm	Gram
Kg	Kilogram

Q	Quintal
T	Tonne
Fps system	Foot pound second system
°C	Degree Celsius temperature
Fig	Figure
Re/Rs	Rupee/ Rupees
No	Number
Dia	Diameter
AC	Asbestos cement
CI	Cast Iron
GC	Galvanised corrugated
GP	Galvanised plain
GI	Galvanised iron
PVC	Polyvinyl chloride
RCC	Reinforced cement concrete
SW	Stone ware
SWG	Standard wire Gauge

11. TECHNICAL SPECIFICATION

The work shall be carried out as per CPWD Specifications-Internal-2017 as amended from time to time and relevant IS codes. In case of discrepancy between technical specification and BOQ, the BOQ prevails.

Sl.No.	ITEM DESCRIPTION	MAKE
1	Air circuit breaker	Schneider / L&T / ABB / GE
2	MCCB	Schneider / L&T / ABB / GE
3	Relays	AVK-SEGC / ABB / Telemecanique / L&T / Schneider
4	Power factor relay	Epcos / Ducati / Beluk / Enercon / Meher
5	Change over switch	HPL / Schneider / L&T / ABB
6	Power contactors	L&T / ABB / SCHNEIDER / TELEMCHANIQUE
7	Instrument transformers	Kappa / Kalpa / Instrans / Voltamp
8	Capacitor banks with series reactors with harmonic filters	Epcos / Ducati / Meher
9	LT panel fabrication including Bus duct	Power Control Equipments / Lotus Power gear / CPRI Approved
10	Meters	Conserv/ L&T/ AE/ Elmeasure
11	Panel accessories / terminal block	As per manufacturer specified make
12	MCB / MCB DB	Legrand / Schneider / Havells / L&T / Siemens
13	ELCB / ELMCB / RCBO	Legrand / Schneider / Havells / L&T / Siemens
14	LT Cable	Finolex/ Poly Cab / Havells / KEI
15	End Termination Materials	Dowels / SMI / Wago
16	MS Powder coated Cable Tray	As per panel fabricator
17	PVC Conduits - FRLS	VIP / Avon / Precision / Universal
18	PVC Wires & Flexible Cables - FRLS	Anchor / Power Flex / Finolex / L&T / Havells
19	Modular switches and socket	Anchor Woods / MK / Legrand
20	Industrial sockets	Legrand / L&T / ABB
21	Light fixtures - working area	Philips / Wipro / Crompton/Havells
22	Light fixtures - decorative	Philips / Wipro / Crompton/Havells
23	Streetlight pole	Klite / Shubham / Jindal
24	Glands - Single / Double Compression	Dowells
25	Aluminium / Copper Lugs	Dowells
26	Aviation Light	Bajaj / Eqvt.
27	Surge Arrestors	L&T / ABB / OBO Bettermann

LIST OF APPROVED MAKE

GENERAL SPECIFICATIONS

PART -1 Specifications for Civil Works

1.0 EXCAVATION

- 1.1 The places where excavation is directed to be done shall be cleared of all shrubs, weeds, grass and vegetation including roots, where necessary and if so directed, the excavated earth must be deposited in layers of 15 cms and the clods broken. During excavations, if so directed, 'dead-man' (of volume not more 5% of the excavation volume shall be left at the places directed for verification of the dimensions of excavation). These 'dead-man' shall be removed and earth deposited at places shown before full rate is paid, Alternatively or in addition to 'dead-man', block level at intervals as directed will be jointly taken and recorded by the contractors representative and employer's representative before starting of excavation and after completion. Recording of – block levels or leaving of 'dead-man' may be avoided in the case of narrow foundations and trenches, if so directed.
- 1.2 The rate quoted shall include bailing or otherwise removing all water which may accumulate in the excavation from all causes and removing of swish, trimming of all sides plumb or otherwise as directed, dismantling removing and stacking as directed any existing water pipes and or soil pipes etc., encountered within the excavation.

2.0 CONCRETE WORKS

- 2.1 Proportion of ordinary cement concrete will be expressed as 1:4:8, 1:3:6, 1:2:4 etc., The first figure will be quantity of ordinary Portland cement by volume, the second figure will be dry coarse sand (fine aggregate) by volume and the third figure will be the quantity of coarse aggregate by volume. Cement shall be measured by weight. The weight is to be derived on the basis that one cubic meter will weigh 1440 kg or one full bag of 50kg will be assumed to be 35 lts. When the sand is wet or moist suitable corrections for bulking is to be given while proportioning. The clerk of works may allow measuring cement by volume.
- 2.2 Unless otherwise specified, the rates for all RCC will be exclusive of reinforcements but including from work, Reinforcements will be measured and paid separately.
- 2.2.1 Unless otherwise stated for all RCC work the size of coarse aggregate will be 20MM and down size.
- 2.2.2 Concrete proposed for roof slab and roof beams is ready mixed concrete. The contractor should quote, his rate keeping in view that the rate should include for ready mixed concrete all as per specifications and directions of Engineer-in-charge.
- 2.3 READY MIXED CONCRETE (RMC) IS: 4926-1976
- a. The RMC from suppliers of ACC/L & T/Fletcher challenge should only be used.
 - b. The rates are inclusive of all lead and lift. Additional lead and lift charges.
 - c. The rate is inclusive of all necessary form work, centering and scaffolding capable of withstanding pumping of concrete.
 - d. The rates are applicable to the materials with a maximum radius of 25 km from the city center.
 - e. Test results of concrete for 28 days strength be obtained from the concerned RMC supplying firm

2.4 MATERIALS.

2.4.1 Cement:-

2.4.1.1 Cement shall comply in every respect with the requirements of the latest publication of IS: 269 and unless otherwise specified, ordinary Portland cement shall be used. No other make of cement but that approved by the Architects/ Employers will be allowed on works and the source of supply shall not be changed without approval of the Architects/Employer in writing test certificates to show that the cement used fully complies with the relevant IS specifications shall be submitted to the Architects/ Employer and notwithstanding this the architects may at their discretion order that the cement brought to site and which they may consider damaged or of doubtful quality for any reasons whatsoever shall be rested in an approved testing laboratory and fresh certificate of its soundness shall be produced, Cement ordered for retesting shall not be for any work pending results of retest.

2.4.1.2 Cement shall be stored neatly packed in piles not exceeding 10 bags high in weather-proof sheds with raised wooden plank flooring to prevent deterioration by dampness or intrusion of foreign matter. It shall be stored in such a way as to allow the removal and use of cement in chronological order of receipt, i.e., the first received being first used. Cement deteriorated and/or clotted shall not be used on work but shall be removed at once from the site daily record of cement received and consumed shall be maintained by the contractor in an approved form and a copy submitted to the employer once a month.

2.4.2 Fine Aggregates:

2.4.2.1 Sand shall conform to IS: 383 it shall pass through IS sieve 4.75mm (3/ from a 16" B S) test sieve, leaving a residue not more than 5%. It shall be from a natural source or crushed stone screedings it shall be washed, if directed, to reduce the percentage of deleterious substances to acceptable-limits. Sand shall not contain any trace of salt and sand containing any trace of salt shall be rejected.

2.4.2.2 The fine aggregate for concrete shall be graded within limits as specified in IS: 383 and the fineness modulus shall range between 2.60 to 3.20 the fine aggregates shall be stacked. Carefully, on a clear hard dry surface so that will not get mixed up with deleterious foreign materials. If such a surface is not available, a platform of planks or corrugated sheets or brick floor or concrete floor shall be prepared. Sand shall be added in the desired proportion as required for the strength specified, with suitable correction for "bulking".

2.4.2.3 Coarse aggregates: Coarse aggregate shall conform to IS:383. It shall consist of crushed or broken stone, 95% of which shall be retained on 4.75 mm IS test sieve. It shall be obtained from crushed granite, trap, basalt or similar approved stones from approved quarry. Coarse aggregate shall be chemically inert when mixed with cement and shall be angular in shape and free from soft friable thin porous laminated or flaky pieces. It shall be free dust and other foreign matter. – Gravel/shingle of desired grading may be permitted as a substitute in part or full in plain cement concrete if the Architect/Employer is otherwise satisfied about the quality of aggregate.

2.5 MIXING OF CONCRETE:

2.5.1 Machine mixing:- Aggregates shall be accurately measured out in boxes and mixed dry along with required cement. Water shall then be added in measured quantity and mixing shall be continued until there is uniform distribution of the materials and the mass is uniform in colour and consistency but in no case shall the mixing be done less than two minutes. Only hopper loading mixer shall be used.

2.5.2 Hand mixing: when hand mixing is permitted with the approval of the Chairman, Department of Civil Engineering, it shall be carried out in water tight, mixing platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. If required by, the architect/consultant 10% extra cement has to be used at the contractor's cost if hand mixing is done.

2.5.3 Consistency:

2.5.3.1 Only sufficient water giving due allowance for the moisture content of aggregate shall be added to the cement and aggregate during mixing to produce a mixture of sufficient workability to enable it to be well consolidated to be worked in to corners of the shuttering and around the reinforcements (where there is reinforcements) to give the specified finish and to have the specified strength.

2.5.3.2 Normally for every 50 kg of cement in the concrete in the mix, total water including moisture content of aggregate should not be more than 34 lts for 1:3:6 mix, 32 lts for 1:2:4 mix 30 lts for 1:1 ½ :3 and 27 ltrs for 1:1:2 mix

2.5.3.3 If difficulty be experienced in placing concrete of specified mix and approved consistency between and below reinforcement bars, in the bottom of beams and similar situations, the concrete shall have improved workability by increasing the proportion of water with corresponding additional quantity of cement using aggregates of smaller size than specified as directed by the Architect/ Employer for which extra will be paid.

2.5.3.4 The consistency shall be determined by making trail mixtures with dried aggregates, or. When so instructed by test laboratory made test cubes under the direction of Architect/ Employer by slump – Test using a standard cone or the Architect/Employer may direct the use of any other means of testing the consistency.

2.5.3.5 If the apparatus used for the slump test is a standard cone, the cone when filled, shall be raised vertically – clear of the concrete: The 'slump' shall be 300mm minus the height of the slumped cone of concrete. Care shall be taken to prevent vibration of the samples being tested. The following slumps shall be adopted for different kinds of works:

		With Vibrator	Without Vibrator
A	Mass concrete in RCC foundations, footings and retaining walls	10 to 25mm	80 mm
B	RCC beam, slabs and columns	25 to 40 mm	100 to 125 mm
C	Thin RCC section or section with congested steel	40 to 50mm	125 to 150mm

2.5.4 Placing and Compacting

2.5.4.1 Method of placing concrete shall be such as to preclude segregation and as far as practicable the placing shall be continues.

2.5.4.2 Special care shall be taken in accordance with 18:456 while laying concrete under extreme weather. Concrete, during the operation of placing shall be thoroughly worked around the reinforcements, embedded fixtures, spaded against comers of the form work by punning, rodding or by any other approved means and thoroughly compacted by mechanical vibrators. The number and type of vibrator to be used, and in general immersion type vibrators shall be used.

2.5.4.3 Consolidation by using immersion vibrator will be in accordance with Is: 3558 sufficient number of reserve vibrators in good working condition shall be kept on hand at all times, so as to ensure that there is no slacking or interruption in compacting.

2.6 ADMIXTURE

The use of admixtures may be allowed only if approved by the Architect/Consultant their decision in this regard shall be final.

2.7 TRANSPORTING

Concrete shall be conveyed from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of any of ingredients? If segregation does occur during transport the concrete shall be remixed before being placed, normally not more than 30 minutes shall lapse between mixing and consolidation in position.

2.8 CURING:

All cement concrete after laying shall be protected from damages, till it sets and shall be cured thereafter for not less than ten days. The work shall be protected from direct wind and direct sun, rays. Water used for curing shall be free from sediments of any kind and generally fit for drinking.

2.9 STRENGTH OF ORDINARY CONCRETE:

2.9.1 The Contractor has to ensure that proper- materials in specified proportion are used and the correct water cement ratio, just sufficient for the workability is maintained to see that the minimum strength of concrete as provided under paragraph 3.9.2 (below) are obtained. To verify this, test cubes from the concrete pours should be made and tested. The frequency of testing and the acceptability criteria will be according to IS: 456.

2.9.2 Compressive strength of 15 cm cubes at 28 days after mixing shall be as follows: same as Para 3.13.2

2.9.3 Six cubes shall be taken from any mix selected at random as directed by Engineer-in-charge three of these should be tested after 7 days and three after 28 days. The strength at 7 days must be 2/3 of the strength at 28 days. The criteria for acceptance are only the strength at 28 days.

2.10 FORMWORK AND CENTERING

2.10.1 The form: work shall conform to the shape, lines and dimensions of the faces of concrete shown on the drawings and be so constructed as to remain sufficiently rigid the placing and compacting of the concrete and shall be sufficiently watertight to prevent loss of cement slurry from the concrete. Form work shall be constructed of steel or timber or marine plywood and adequately designed to support the full weight of wet concrete (deflection limited to 3mm) and retain its form during laying, consolidation and setting of concrete. Timber used shall be properly seasoned so as to prevent deformation when wetted.

2.10.2 Props shall be straight and of full height and no joints shall be allowed props be braced bamboo's or wooden battens or other means in both directions at I intervals of 1500mm and where additional staging is necessary, extra care shall be taken to use bigger size props with bracing at necessary levels. All the props shall be supported on sole plates double wedged. At the time of removing props these wedges be gently eased and not knocked out.

2.10.3 All rubbish, chipping, shavings, sawdust etc., shall be removed from the interior of the forms before concrete is placed. The form work in contact with the concrete shall be cleaned and thoroughly wetted and treated with non-staining mineral oil or any other approved material. Care shall be taken that oil or such similar material is kept out of contact with the reinforcement.

- 2.10.4 Officer, GGMD at convenient places for washing down all the rubbish. These are to be closed before concreting.
- 2.10.5 All form work shall be removed without shock or vibration and shall be eased off carefully in order to allow the structure to take up its load gradually. Forms shall not be disturbed until concrete had adequately hardened to take up its own weight and superimposed load coming on it and in no circumstances shall forms be struck until the concrete reaches its strength of at least twice the stress to which the concrete may be subjected to at the time of striking. The said forms shall be so fixed that while removing them the supporting forms and props are not disturbed.
- 2.10.6 In the case of folded plates and shell roofs the contractor should take prior approval of the pattern of centering and shuttering along with programme for deshuttering.
- 2.10.7 The tolerance of shuttering and stripping time will be as set forth in IS : 456 if directed, forms shall be given an upward camber to ensure that the beams do not have any sa. No honey combing will be permitted, however any honey combing of minor nature as specifically allowed by the clerks of works shall be repaired neatly be with cement mortar 1:2
- 2.10.8 Any work showing signs of damage through premature or careless removal of centering or shuttering, shall be reconstructed by the contractor at his own cost. Surface that has to remain exposed after removal of forms shall be carefully examined and any fins, burrs, projections etc., that are detected shall be removed
- 2.10.9 Centering and shuttering is specified to be paid for separately, measurement of such centering and shuttering will be taken according to IS: 1200
- 2.11 Steel Reinforcement
- 2.11.1 Reinforcement for all works shall be TMT steel bars, as specified in the drawings. TMT steel bars shall be of tested quality conforming to grade I of IS : 432 and high yield strength (of 550 N/sqmm) TMT bars shall be of IS:1786 or 1139 as appropriate. Reinforcement where called for shall be kept clean and free from pitting, loose rust millseale- oil, grease- earth paint or any material which may impair the bond between concrete and reinforcement or which may cause high corrosion of the reinforcement or deterioration of the concrete.
- 2.11.2 Reinforcement shall be accurately done to the dimensions, spacing and minimum cover as per structural drawings. The contractor shall submit to the clerk of work bar bending schedules, prior to the commencement of fabrication. All joints in TMT reinforcement up to and including 16mm dia shall be overlapped. The length of overlap for tension and compression joints in TMT steel reinforcement above 16mm dia may be welded subject to the approval of the Chairman, Department of Civil Engineering.
- 2.11.3 Wherever specified and / or approved, welded laps shall be provided subject to the following.
- 2.11.3.1 Random samples of typical – welded joints shall be made and got tested in an approved laboratory at the contractor's expenses.
- 2.11.3.2 If the cold twisted deformed bar has an untwisted end at lapping joint, such portion – shall be cut off prior to welding.
- 2.11.3.3 Bars shall be free from rust at the joints to be welded.

2.11.3.4 Bars can be aligned and kept in proper axis in order to minimize crookedness in bar welding.

2.11.3.5 Nothing extra shall be payable towards lap welding of joint unless specifically mentioned or agreed otherwise.

2.11.4 Reinforcement shall be rigidly held in place inside the form work using chairs (bent from steel bars) spacer bars and cement concrete blocks each block shall be secured to the reinforcement with wire or clip embedded in the center of block so that it shall not be in contact with form work. Interactions of reinforcement shall be bound together with 18 gauge annealed soft iron binding wire.

2.11.5 Before proceeding to place reinforcements the contractor shall ensure that appropriate cover between the bars and or the form work is available. Should any difficulty arise during the placing of steel in obtaining the required cover the contractor shall immediately draw the attention of the architect/consultant to the difficulty and shall carry out such corrective measures as the architect/consultant may instruct.

2.11.6 Reinforcement left projecting from newly placed concrete shall be supported in a way there is no risk of disturbance, which would cause damage to newly placed concrete.

2.11.7 The contractor shall ensure that movement of men and material subsequent to fixing in position of the reinforcement is organized such that displacement of the reinforcement will not occur.

2.11.8 The measurements recorded for reinforcements shall be including all laps and wastages as approved by the Chairman, Department of Civil Engineering's representative.

2.12 INSERTS IN CONCRETE

The contractor shall fix all necessary inserts such as steel – plates, pipes, sleeves, bolts etc., and shall make provisions in the form work for holes, pockets, dowels, etc., at no extra cost (unless otherwise specified) to enable, subsequent fixing of supports, brackets or similar items. He shall also ensure that all conduits, inserts etc., are in position before placing concrete.

2.13 CONTROLLED CONCRETE

2.13.1 Controlled concrete shall be taken to mean that there shall be full field control of (a) predetermined grading of all aggregates that go into concrete and (b) Predetermined proportion of coarse aggregate, fine aggregate, cement and water for the required strength.

2.13.2 Strength shall mean the acceptable field strength after 28 days of curing on the tests conducted on 15 cm cubes from concrete taken during concreting in the manner set forth in IS 456. A statement to acceptable minimum field strength is noted below.

Compressive Strength			
Grade	Preliminary test (Kg/ Sq Cm)	Work Test (Kg/Sq Cm)	
M10	135	100	
M15	200	150	
M20	260	200	

80

M25	320	250
M30	380	300
M35	440	350
M40	500	400

- 2.13.3 Arrive at the proportion to be adopted to obtain the grade of concrete, the mix should be based on laboratory tests conducted using the aggregate actually available at site which would be used for making/ concrete. The design mix should give suitable workability to enable it to be well consolidated to be worked into the corners of the shuttering and around the reinforcement.
- 2.13.4 Where difficulty is likely to be encountered in placing and compacting concrete and where there is crowding of reinforcements a separate mix is to be designed for required strength and used without extra cost, the mix design along with the workability obtainable with the designed mix should be furnished to the architect/employer beforehand approval obtained. A laboratory is to be established at site to assess the moisture content of aggregate as frequently as necessary and as instructed by the Architect/employer based on which corrections is to be applied to the quantity of water to be used for mixing.
- 2.13.5 All aggregates are to confirm strictly to IS: 383. The aggregates will be tested as frequently as directed by the Architect/Employer to see that their specifications is the same as adopted in the mix design they must be stored on clean plat form made for the purpose.
- 2.13.6 Concrete shall be weigh batched, Dials of weigh batching unit to be used shall be checked with standard weights periodically. The conversions of weights volume will be allowed by Chairman, Department of Civil Engineering, under special circumstances. Despite the design for several, mixes the following quantities of cement are the minimum to be used per cubic meter of the different grades of concrete.

Sl No	Grade of Concrete	Cement/ Cum (Bags)
1	M5	3.20
2	M7.5	3.60
3	M10	4.40
4	M15	4.80
5	M20	6.40
6	M25	6.80
7	M30	7.20

3.0 SIZE STONE MASONRY

- 3.1 Size stone shall be hard granite, basalt or trap stone obtainable from approved quarry, the stones shall be clean and wetted before they are used

3.2 Height of each course shall not be less than 15cm and all courses shall be of uniform height.

3.3 No face stone shall be less in depth than in height or shall tail into the work to a length less than the height stone shall break joints at least half the height of course faces of stones shall be hammers dressed such that the buildings are not more than 25mm thickness of joints shall not be more than 20mm. Edges of face stones of exposed faces shall be chiseled true to both longitudinal and vertical lines exposed faces of corner stones are to be two lines dressed 50mm wide.

3.4 Bond or through stones shall be provided not exceeding 2.0m apart in each course and shall be staggered bond stone shall be from the front to back of the walls fro walls up to 60cms thick; they shall either be in one piece (if available locally) or be in the series of headers; each header overlapping the adjoining one by not less than 150mm bond or through stones shall be marked as directed to enable easy detection even after having been built in position. The interior (or filling) shall be with flat bedded stones laid in mortar joints and shall not exceed 10% of the quantity of stone masonry. Care is to be taken that no dry work or hollow spaces shall be left anywhere in the masonry.

3.5 The work shall include.

3.5.1 All scaffolding – platforms, staging etc.,

3.5.2 Hacking and roughening of concrete or other surfaces for binding of the masonry.

3.5.3 Raking out joints for plastering and / or pointing.

3.5.4 Leveling up and preparing and pointing.

3.5.5 Building in holdfasts or similar inserts.

3.5.6 Keeping (the work) in damp condition for two weeks

3.5.7 Construction watery situation.

4.0 BRICK MASONRY:

4.1 GENERAL

4.1.1 All brick work should be carried out as shown on the drawings with setbacks, projections, cuttings, too things etc., wherever the proportion of cement mortar has not been specifically mentioned, cement mortar in the proportion of 1:6 shall be used. Flat brick arches shall be provided, wherever required, without any extra cost. Brickwork shall be kept wet while in progress till mortar has properly set. On holidays ro when the work is stopped top of all unfinished masonry shall be kept wet, should the mortar be dry, white or powdery, due to lack of curing work shall be pulled down and rebuilt at the contractors expense.

4.1.2 Table moulded bricks shall be locally available or brought from outside first quality having a minimum crushing strength of 40kg per sqcm and water absorption not more than 20% by weight. Bricks shall be thoroughly cleaned and well wetted. Table moulded bricks shall be soaked for atleast 12 hours in fresh water before being used on the work.

4.1.3 Unless otherwise specified, brickwork shall be done in English bond with frog upwards. The bricks shall be bedded and joined with mortar in such a manner as not to leave voids. Each brick shall be correctly into position by tapping with the handle of trowel. Grouting of mortar slurry will not be allowed expect where necessary for special reasons and in such cases, prior permission of the Architect/ Employer shall be obtained.

4.1.4 A care shall be taken that each course of brick work is truly horizontal and perfect in bond and the face of the wall is straight, plumb and even. The mortar joints shall be 10mm in thickness, except where extra thickness is required for the purpose of bringing the work to the required height or level. Half bricks or bats shall not be used except for obtaining the bond and where absolutely necessary.

4.1.5 Brickwork in 239 mm wall: If bricks are of size such that the width of the header course does not come equal to the width of the stretcher course, the difference shall be made up during construction of brickwork itself by same mortar as used for construction of masonry to provide a plane vertical surface. The surface should also be scarified to receive plaster.

4.1.6 All junctions of wall shall be carefully bonded into the main walls. The rate of laying masonry will be up to a height of 100cm per day if cement mortar is used greater heights may be built only if permitted by the Chairman, Department of Civil Engineering.

4.1.7 During rains, the work shall be carefully covered to prevent mortar from being washed away. Should any mortar or cement be washed away the work shall be removed and rebuilt at the contractors expense.

4.2 HALF BRICK WORK:

This shall be set in cement mortar as specified. Unless otherwise specified, the walls be reinforced with 2 no's of 6mm mild steel bars with tie bars at 1m interval on the top of the first course and at every fifth course thereafter. The cost of the half brick work shall include the cost of reinforcement where reinforcement of half brick walls is specified.

5.0 Wood Works:

5.1 GRP Door shutters as per the Engineer-in-charge/ Architects approval

5.2 GLAZING WORKS

All glass shall be specified in the drawings and schedule of quantities and free from air bubbles, specks and scratches or other defects. All glass shall be cut to fit the sashes or other members as required. All glass, shall be properly bedded, securely fixed and finished as indicated on the drawings. T.W beading moulded as specified shall be provided for fixing the glass. No glazing shall be complete until all the stains and marks have been removed from the surface of glass.

6.0 ALLUMINIUM DOOR, WINDOWS ETC.,

6.1 GENERAL

6.1.1 These shall be custom-built units of approved established manufacturer using standard aluminum alloy extruded sections generally conforming to the relevant basic concept drawings of the Architects and Schedule of quantities including necessary glazing's, fittings, fastenings, locking arrangements polysulphide sealants etc., to ensure water tightness.

6.1.2 Based on the Architects concept drawings, the contractor shall submit detailed fabrication/ assembly/ erection drawings for the approval of the Engineer-in-charge. Samples of each unit, based on the approved fabrication and assembly drawings shall be made by the contractor and got approved by the Engineer-in-charge before bulk fabrication and assembly of each unit

6.2 STORAGE AND HANDLING:

The contractor shall take particular care to stack the fabricated frames etc., on the site under cover. These shall be handled with care and stacked on edge of level bearers and supported evenly.

6.3 Before erecting- the frames coming in contact with concrete, masonry, plaster or dissimilar metals, shall be treated with a coat of zinc chromate. The contractor shall cover the work with transparent lacquer based or methacrylate or cellulose butyrate, the surface from wet cement during installation. This coating shall be removed on completion. Before handing over, the aluminium work shall be washed with mild solution of non-alkali soap and water.

6.4 The colour of anodizing shall be uniform mat natural finish otherwise stated and its sample shall be submitted for the Engineer-in-charge, approval before work commences. The section shall be anodized to a minimum thickness of 20 microns. The contractor must submit necessary evidence to the satisfaction of the Engineer-in-charge that the thickness of the anodisation is not less than 20 microns. In case of doubt the Engineer-in-charge may reject the materials.

6.5 TOLERANCE ON SIZE.

Frames should be made to fit the actual openings with not more than 5mm clearance all round. Discrepancies in overall width or height exceeding 5mm will not be allowed and frames will be rejected in such cases. Minor discrepancies acceptable to the Architect/Employer shall have the gaps suitably filled. The sizes of frames, if noted in the drawings/schedule of quantities, may vary up to plus or minus 50mm beyond which the rate payable will be increased or decreased proportionate to the changes, where the rate quoted is for one unit number, if the rate quoted is for superficial area, such area will be net finished size of the opening.

7.0 STEEL WORK:

The fabrication, supply and erection of the steel (Fe 500 N/mm²) work consists of accomplishing all related jobs like providing all labour, tools and plant, all materials and consumables such as welding electrodes, bolts and nuts, oxygen and acetylene gases, oils for cleaning etc., All of approved quality, the work shall be executed. In an expeditious and workmen like manner, as contemplated in the drawings and to the complete satisfaction of the Chairman, Department of Civil Engineering, representative. The work shall also include providing shop primer coat of paint and grouting of hold down bolts.

8.0 PLASTERING- WORKS:

8.1 EXTENT AND INTENT

The contractor shall furnish all materials, labour, scaffolding, equipment, tools, plant and incidentals necessary as required for the completion of all plaster and wall finishes, subject to approval by the Chairman, Department of Civil Engineering.

8.2 GENERAL

8.2.1 Plaster as here in specified shall be applied to all internal and external surfaces where called for. Flazed tile dado, terrazzo dado and wall finishes other than plaster shall be provided where indicated on drawings and schedule of finishes. Areas called for on

drawings and typical shall be considered to apply to appropriate adjoining area whether shown on same drawings or not whether indicated or not.

8.2.2 All plaster works and other wall finishes shall be executed by skilled workmen in a workman like manner and shall be of the best workmanship and in strict accordance with the dimensions on drawings subject to the approval of the Chairman, Department of Civil Engineering.

8.2.3 The primary requirement of plaster work shall be to provide absolutely water tight enclosure, dense, smooth, and hard and devoid of any cracks on the interior and / or exterior. The contractor shall do all that is necessary to ensure that this objective is achieved. All plastering shall be finished to the true plane, without any imperfections and shall be square with adjoining work and form proper foundation for finishing materials such as paints etc.,

8.2.4 Masonry and concrete surfaces, which call for applications of plaster, shall be clean, free from efflorescence, damp and sufficiently rough and keyed to ensure proper bond, subject to the approval of the Chairman, Department of Civil Engineering Chairman, Department of Civil Engineering.

8.2.5 Wherever directed by the Chairman, Department of Civil Engineering, or other representative, all joints between concrete frames and masonry infilling shall be expressed by a groove cut in the plaster. The said groove shall coincide with the joints beneath as directed. Where grooves are not called for the joints between concrete members and masonry infilling shall be 24 gauge galvanized chicken mesh strip 400mm wide or as called for on drawings/documents which shall be in position before plastering.

8.3 CHASING AND CUTTING:

All chasings, installations of conduits, insert boxes etc., shall be completed before any plastering or other wall finish is commenced on a surface. No chasing or cutting of plaster or other finish on a surface shall be permitted. Broken corners shall be cut back not less than 150mm on both sides and patched with plaster of Paris as directed. All corners shall be rounded to a radius of 8mm or as directed by the Chairman, Department of Civil Engineering.

8.4 SAMPLES:

Samples of each, type of plaster and other wall finish shall be prepared well in advance of undertaking the work for approval by the Chairman, Department of Civil Engineering.

8.5 PROPORTIONS:

The materials used for plastering shall be proportioned by volume by means of gauge boxes.

8.6 PREPARATIONS OF SURFACES.

The joints in all walls, both existing and freshly built shall be raked to a depth of 15 cleaned with wire brushes, dusted and thoroughly wetted before starting plastering work. Concrete surfaces to receive plaster shall be roughened by hacking over the entire surface so that the skin of the concrete is completely removed, as approved by the Architect/ Employer to ensure proper key for the plaster.

8.7 PLASTER TO WALLS:

Unless otherwise specified, all works shall be plastered and finished as follows:

Internal faces : 20mm thick with cement mortar 1:6 (one part of cement and six parts of fine river sand) finished smooth with lime rendering.

External faces: 12mm thick base coat with cement Mortar 1:4 (one part of cement and four part of fine river sand) finished rough to receive the final coat and 6mm thick final coat with cement mortar 1:3 (one part of cement and three parts of coarse river sand) sponge finished.

8.8 MORTAR MIXING

Mortar shall be prepared as specified in small quantities as required and applied within fifteen minutes of mixing.

8.9 Plaster application shall be commenced only after the preparatory work is approved by the Chairman, Department of Civil Engineering. Correct thickness of plaster shall be obtained by laying plaster screeds (gauges) at intervals of 1.5 m as directed. Mortar shall be firmly applied, well pressed, into the joints, rubbed and finished to give a smooth and even surface to the satisfaction of the Chairman, Department of Civil Engineering.

8.10 CURING

Finishing Plaster shall be kept wet for at least ten days after completion in hot weather, walls exposed to such shall be screened with matting kept constantly wet or by other approved means.

8.11 CLEANING PLASTERING:

Plaster to ceiling, so fits of stairs flight slabs and similar locations, where called for, shall be 12 mm thick comprising of one part cement and three parts of clean fine sand unless otherwise specified. The surface shall be brushed, swept clean and thoroughly wetted before plastering. Mortar shall be applied firmly pressed to the surface, rubbed and finished smooth evenly subject to the approval of the Chairman, Department of Civil Engineering.

8.12 CEMENT MORTAR:

8.12.1 Cement mortar shall be of proportion specified for each type of work. It shall be composed of Portland cement and sand. The ingredients shall be accurately gauged and shall be evenly mixed together in a mechanical mixer. Care should be taken not to add more water than necessary. If hand mix is allowed, it shall be done on pucca waterproof platform. The gauged materials shall be put on platform and thoroughly mixed dry. Water shall Then be added and the whole then be added and the whole mixed thoroughly until the mix is homogeneous and of uniform colour. Quantity of mortar mixed should not be more than what can be consumed within half an hour of mixing.

8.12.2 Cement mortar mix are specified in 1:2, 1:3, 1:4, 1:5 etc., the first figure will mean one part of Portland cement by volume and the second will mean so many parts of sand by volume. For example cement mortar 1:4 would mean one part of cement and four parts of sand.

8.12.3 Cement and sand must conform to relevant I.S specification

8.13 LIME RENDERING:

This will be prepared out of best quality fat lime slaked at site with fresh water not less than one week or not more than two weeks before use. All impurities, ashes and improperly burnt stuff shall be screened and picked out before slackening. Slaked lime shall be screened through to remove all unslaked materials, stones etc., so that only a fine creamy paste is available for rendering. Slaked lime is to be diluted with just sufficient water to give a thick consistent pulp suitable for effective covering of base surface. Before the base

coat sets, the lime rendering is applied and finished smooth and the entire plastered surface is made truly plane.

9.0 FLOORING: GRANOLITHIC FLOORING

9.1.1 General:

The flooring shall be of specified thickness and shall consist of 1:2:4 concrete base or as specified and 12mm thick granolithic wearing coat. The granolithic flooring shall be laid in alternate panels. The size of panels shall be as decided by the Chairman, Department of Civil Engineering.

9.1.2 Laying of 1:2:4 concrete base:

9.1.2.1 The 1:2:4 concrete shall be of graded coarse aggregate of maximum size 10mm, coarse sand and cement. The ingredients shall be thoroughly mixed with sufficient water to obtain the required plasticity.

9.1.2.2 The free water on the surface of the base shall be removed and a coat of cement slurry of the consistency of thick cream shall be brushed on the surface.

9.1.2.3 The prepared 1:2:4 concrete shall be laid immediately after mixing on the fresh grouted base. The concrete shall be spread evenly and leveled carefully. Low places shall be filled, humps removed and the whole surface again leveled. The layer shall be compacted by ramming trowel led and allowed to set.

9.1.2.4 Mixing and laying of wearing coat: one part of cement in dry state shall be mixed with 1.5 parts by volume of well graded/crushed granite chips of 6mm maximum size. The ingredients shall be then mixed with sufficient water so for ordinary concrete. The wearing coat shall be laid 12mm thick over the base concrete immediately after it has set, compacted and leveled with a steel trowel. Just sufficient trowelling shall be made to give a level surface. The surface should not be over trowelled as excessive trowelling will bring the cement to the surface which shall be strictly avoided. When the initial set takes place, further compaction by steel trowelling shall be done and final brushing shall be made before the topping becomes too hard.

9.1.3 Curing as soon as the surface is hard enough, it shall be covered with sacking or sand and kept continuously wet for a period of at least one week.

9.2 A bed of cement mortar 1:4 shall be laid and properly leveled to average thickness of 20mm and the surface kept slightly rough to form a satisfactory key for the tiles, neat cement paste of honey like consistency shall be spread over mortar bed, over such an area so that the paste will not harden before laying tiles. Slabs shall be soaked in water for 15 minutes and allowed to dry. The slab shall be then fixed as per approved pattern with thin coat of cement paste applied on back of each slab and tapped with a wooden mallet till it is properly bedded in level with adjoining slabs. Joints shall be not more than 1:5 wide. The surplus cement grout that may have come out of the joints has to be wiped off gently and joints cleaned. The joints shall, be filled up with grey or white cement with an admixture pigment to match the shade of the slab. The flooring shall be cured for 14 days. Then it shall be polished according to IS: 1443, and pointed with cement mortar: 1:1 (1 part of cement and 1 part of fine screened sand) mixed with matching colour pigment.

9.3 GRANITE SLAB WORK:

9.3.1 General: The slab must be of uniform thickness as specified, the variation in the thickness not exceeding 12 mm and must be from the same source. They shall be of uniform texture and colour free of any veins and streaks. All the edge shall be chiseled true to line, square and shape. The surface should be rough dressed/ one line dressed. Three line dressed pulman dressed/mirror polish as specified.

- 9.3.2 Rough Dressing: The stone surface to be chisel dressed to one plane by removing all bushings so that the maximum depression is not more than 6 mm.
- 9.3.3 One Line Dressing: This is done after the rough dressing is completed by point chiseling so that the variations are not more than 4mm. Work includes rough dressing also.
- 9.3.4 Two Line Dressing: This is done after, one line dressing is done by chiseling so that variations are not more than 2.5mm work includes rough and one line dressing also.
- 9.3.5 Three Line Dressing: This is done after two lines dressing is over by chiseling so that variations are not more than 1.5mm work includes rough, one line dressing also.
- 9.3.6 Pulmane Dressing: After the three line-dressing is over, the surface is smoothed by using a special pulmane tool to further even out three line dressed surface so that the maximum variation in surface evenness is not more than 1.0mm work includes rough, one line, two line and three line dressing also unless otherwise stated.
- 9.3.7 Mirror polishing: The surfaces are to be polished by grinding using manual or mechanical process to give a smooth even perfect plane surface or as may be directed. The polished surface should reflect light like a mirror and must be free from scratches and depressions.

9.4 GLAZED TILING

- 9.4.1 Glazed tiles shall be from an approved manufacture conforming to IS.777 of specified size, thickness and colour, All specials viz coves, internal and external angels, corners beads etc., shall be used wherever directed. Under layer of 12mm average thickness of cement mortar 1:3 proportion shall be laid tiles shall be well soaked in water washed clean and set in cement grout each tile being gently tapped with wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints should be kept as thin as possible and in straight lines or to suit the required pattern after tiles have been laid surplus cement grout shall be cleaned off the depth of % mm and all dust and loose mortar removed joints shall then be flush pointed with white cement if necessary mixed with pigment to match the colour of the tile. The floor / dado shall be kept wet for 14 days, after curing the surface shall be washed with mild hydrochloric acid and clean water, the finished floor/ dado shall not sound hollow when tapped with wooden mallet, the rate will include the cost of under layer of cement mortar.

10.0 PAINTING

- 10.1 The specifications covers the various types of all surfaces thought the interior and exterior of the building the number of coats required in various situations and also the type of finish required for the several items of work such as cement based paint, plastic emulsion point, oil bound distemper etc., are specified in the schedule of quantities and specifications.
- 10.2 Before commencement of the work, the contractor shall provide sample panels of painting at this own cost for the approval of the Chairman, Department of Civil Engineering, to enable him to keep an accurate check on the materials supplied and final shade to be painted. It is however, the responsibility of the contractor to provide any deviations and defects shall have to be Rectified by the contractor at his own cost.
- 10.3 Contractor shall protect not only his own work at all times but also all the adjacent work and materials by suitable covering, protection or other methods acceptable to the Chairman, Department of Civil Engineering during progress of painting, it is of painting work to remove all paint and varnish spots from floors, walls , glass panes and other surfaces and restore them to original conditions. The work generally touched up shall be attended to after all workmen have left. Accumulated – material, rubbish etc., have to be cleared and the premises left in clean, orderly and acceptable conditions.

10.4 Contractor shall provide scaffolding wherever necessary erected on double supports tied together by horizontals. No ballies, bamboos or planks shall rest on or touch the surface, which is being painted. Contractor is demand to have considered the following while tendering and no extra claim on account of these will be entertained.

10.4.1 Supplying the paint and other materials required of approved colour and brand.

10.4.2 Preparing the surfaces to be painted.

10.4.3 Providing and erecting scaffolding and removing the same after completion of the

10.4.4 Lifting of materials to any height and painting at all levels.

10.4.5 Applications of painting as per the specification and to manufactures instruction.

10.4.6 Curing, protecting the painted surfaces and adjacent work and thoroughly cleaning of premises.

10.5 The paint shall generally conform to the chemical composition and other characteristics laid down in the relevant Indian standard specification. The entire materials required for painting work shall be obtained direct from approved manufactures or their authorized agents and brought to site in original manufactures containers with seals unbroken.

10.6 Paint shall be ready mixed of quality of the approved brand and manufacture. Mixing of paint by the contractor at site will not be allowed, except preparation and their quality shall be strictly maintained as per manufacture's instruction and all as directed by the Chairman, Department of Civil Engineering. All the materials shall be kept properly protected when not actually in use. Lids of containers shall be kept closed. Materials which have become stale or flat (in opinion of the Chairman, Department of Civil Engineering) shall not be permitted to be used on the works and shall be removed from site forthwith. Any materials found not conforming to the relevant specifications shall have to be removed by the contractor from the site at his own expenses.

10.7 Providing two coats of synthetic enamel paint of approved make colour over one coat of primer on plastered surfaces, wooden surfaces and steel surfaces: A fully putty coating has to be given after primer coat in the case of wooden surfaces. The putty shall be made from pure whiting mixed to the proper consistency with new linseed oil, a little white lead being mixed to help hardening of putty. On no account putty is to be used before primary coat. Primers to be used shall be according to the manufacture specifications.

10.8 The manner of taking measurements will be in accordance with ISI: 1200.

11.0 WHITE WASHING

White wash shall be prepared from fat lime or shell lime slaked on site mixed with just enough water to make a thick paste and allowed to remain for at least 7 days before use. At the time of using the paste shall be diluted with just sufficient water and strained through cloth. 4 kg of gun dissolved in hot water shall be added to each cubic meter of cream (115 GMS per eft). Ultra marine blue or other approved locally available colour pigment shall be added to give required whiteness. The number of coats as specified in the bill of quantities shall be added to give required whiteness. The number of coats as specified in the bill of quantities shall be applied by using flat brushes or spray pimps, on surface prepared. Each coat shall be allowed to dry before next coat is applied.

12 TREATMENT FOR SUNKEN FLOOR SLAB:

- A. Brick bat aggregate shall be from well burnt bricks. The proprietary water proofing compound and the quantity to be used shall be as per para 15.1
- B. The surface shall be thoroughly cleaned with wire brushes. All loose scales shall be removed and dusted off. The surface (bottom as well as sides) shall be treated with cement slurry admixed with proprietary water proofing compound to penetrate interstices and fill the pores in the surface.
- C. After the slurry coat is laid, a layer of well burnt brick bats/ aggregates of about 40mm size shall be laid in cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (a cement : 5 coarse sand) admixed with proprietary water proofing compound the mortar being filled to half the depth of the aggregate. The brick bat/aggregate layer shall be rounded off at junctions with the beam all etc., and tapered towards top to a height of 100mm long beams/ wall, etc., curing of this layer shall be done for 3 days.
- D. After curing the surface shall be applied with a coat of cement slurry admixed with proprietary water proofing compound.
- E. Joints of brick bat/ aggregate shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:4 (1 cement. 4 coarse sand) admixed with proprietary water proofing compound and top finished with average 20mm thick layer of some water. This layer of mortar shall be continued to the sides of beam. Wall etc., the height up to which this treatment is to be extended on the sides shall be as directed by the Engineer-in-charge. The surface shall be finished smooth with cement slurry admixed with proprietary water proofing compound.
- F. While the water proofing treatment is in progress it shall be ensured that the outlet pipes are properly fixed and the gap between the wall and pipes are properly filled with brick/stone aggregate and cement mortar admixed with proprietary water proofing compound and grouted with cement slurry admixed with proprietary water proofing compound by injection process.
- G. Water proofing treatment shall be cured for 10 days
- H. Measurements: measurements for the floor treatment shall be taken on plain area of floor treated nothing extra shall be paid for rounding off at junctions and taking the treatment along sides of beams and walls for about 100mm sides of beam/wall etc., where the treatment is only with mortar shall be measured and paid separately , length and breadth shall be measured correct to once centimetre and area calculated correct to 0.01 sqm
- I. Rates: The rates shall include the cost of all labour and material involved in all the operations described above. Base treatment and side's treatment will be paid separately under respective items.

PART II: SPECIFICATIONS FOR WATER SUPPLY AND SANITARY WORKS

1.0 GENERAL

1.0 SCOPE OF WORK:

The general character and the scope of work to be carried out is illustrated in the drawings and specifications. The contractor shall carry out and complete the said work under this contract in every respect in conformity with the rules and regulations of the local authority. The contractor shall furnish all labour, supply and install all materials, appliances, tools, equipments etc., necessary for the complete provision and testing of the whole plumbing services installation as specified here as per the relevant ISI codes as shown on the drawings. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawings as being furnished or installed but which are necessary and customary to make a complete installation as shown on the drawings or described herein, properly connected and in working order.

In general, the work to be performed under this contract shall comprise of the following:

- 1.1 All incidental jobs connected with water supply services installation, such as excavation in trenches and back filling, cutting chases in concrete, brick etc., and making good cutting drilling holes through walls, floors and grouting for embedding of fixtures, equipment and fixing of valves, pumps etc.,
- 1.2 Furnish and install a complete workable, service installation as shown on the drawings and as per the latest ISI specifications including all that which is reasonably inferred.
- 1.3 Complete installation of internal water supply system.
- 1.4 Complete installation of the sewerage and sewerage appurtenances internally and around the building.
- 1.5 Complete installation of all sanitary and plumbing fixtures.
- 1.6 Co-operation with other crafts in putting the installation in places. Any work without regard or consultation with other trades, shall be removed by the contractor without any traditional cost to the employer, to permit the proper installation of all other work, as prescribed by the architects.
- 1.7 Repair all damages done to the premises as a result of this installation and remove all debris arising there from to the satisfaction of Chairman, Department of Civil Engineering.
- 1.8 Cleaning of all plumbing “fixtures, testing and showing satisfactory performance all the fixtures at the time of handing over to the Chairman, Department of Civil Engineering.
- 1.9 It is the responsibility of the contractor to safe guard and takes care of all the fixtures fitted until the time handing over to the Chairman, Department of Civil Engineering.
- 1.10 Painting of all concealed and exposed pipes as specified.
- 1.11 Assume full responsibility of all statutory requirements.

1.12 At the completion of the work, furnish necessary information like invert levels and layout of pipeline etc., and prepare final completion drawings to the Chairman, Department of Civil Engineering.

2.0 REGULATIONS AND STANDARDS:

2.1 The installations shall conform in all respects to the following board list of standards in general:

IS 3114 – 1965	:	Code of practice for laying of CI pipes
IS 1230-1968 steel	:	Specifications for mild steel tube, tubular and other pipe fittings part I
IS 1536 – 1980	:	Centrifugally cast (spun) cast iron pressure pipes for water gas and sewerage.
IS 780 – 1980	:	Sluice valve for water works purposes
IS 1520 – 1980	:	Horizontal centrifugal – pumps.

2.2.1 The installation shall also be in conformity with the byelaws and requirement of the local authority in so far as these become applicable to the installation wherever this “specification calls for a higher standard of materials and / or workmanship than those required by any of the above regulations and standards then this specification shall take precedence over the said regulations and standards. Wherever the specification require something which will violate the regulations, the regulations shall govern.

3.0 PERMITS AND TESTS:

On completion of the work, the Contractor shall obtain and deliver to the Chairman, Department of Civil Engineering certificates of final inspection and approval by the local authority as may be applicable. The Chairman, Department of Civil Engineering shall have full power to require the materials or work to be tested by any independent agency at the contractors expenses in order to prove their soundness and adequacy.

4.0 DRAWINGS AND SPECIFICATION

The drawings and specification shall be considered as part of this and any work or materials shown on the drawings and not called for in the specifications or vice versa shall be executed as if specifically called for in both. The contract drawings shall indicate the extent of general, arrangement of the fixtures, drainage system etc., and essentially diagrammatic. The drawings indicate the points of supply and termination of pipe runs and broadly suggest the routes to be followed. The work shall be installed as indicated on the drawings, however, any changes found essential to coordinate, this work with other trades shall be made without any additional cost. The data given herein and on the drawings is as exact as could be secured but its complete accuracy is not guaranteed. The drawings and specifications are of the assistance and guidance to the contractor and exact location distance and levels will be governed by the individual building and site condition, therefore approval of the Chairman, Department of Civil Engineering on tracing cloth.

5.0 MANUFACTURERS INSTRUCTIONS:

Where manufacturers have furnished specific instructions, relating to the materials used in this job, covering points not specifically mentioned in job, covering points not specifically mentioned in these documents. These instructions shall be followed in all cases.

6.0 CHANGE IN DIMENSION

If the size of the fixture mentioned is not available, then the nearest available size shall be fixed with due consent of the Chairman, Department of Civil Engineering.

7.0 MATERIALS:

- 7.1 Materials shall be of the best quality obtainable and unless otherwise specified they shall conform to the respective Indian Standards Specification.
- 7.2 Samples of all materials shall be as per the list of approved branch manufacture. The samples shall be got approved before placing order and the approved samples shall be deposited with the Chairman, Department of Civil Engineering.
- 7.3 In case of non availability of materials in merits, sizes, the nearest size of EPS units shall be provided with prior approval of the Engineer-in-chief Chairman, Department of Civil Engineering, for which no extra will be paid.

8.0 TRENCHES FOR PIPE DRAINS:

- 8.1 Opening out trenches: In excavating the trenches etc., the road metalling pavement curbing etc., are to be placed on one side and preserved for reinstatement when the trench or other excavation shall be filled up at no extra cost.
Before any road metal is replaced, it shall be carefully shifted, the surface of all trenches and holes shall be restored and maintained to the satisfaction of the Architects. The contractor shall not-cut or break down any live fence of trees in the one of proposed works but shall tunnel under them unless the Architects shall order to the contrary. The contractor shall scrub up and clear the surface over the trenches and other excavations of all stumps, roots and all other encumbrances affecting execution of the work and shall remove them from site to the approval of the Chairman, Department of Civil Engineering.
- 8.2 Cutting of roads: All works across the roads, shall be carried out as per the directions of the Chairman, Department of Civil Engineering.
- 8.3 Excavation to be taken to proper depth: The trenches shall be excavated in all conditions of soil and to such a depth that the pipelines shall rest as described in the several clauses relating thereto and so that the inverts may be at the levels given the drawings. In loose soil, the Chairman, Department of Civil Engineering. May order the contractor to excavate to a great depth than shown on the drawings to fill up the extra excavation with concrete, sand, gravel or other materials. For such authorized filling of materials the contractor shall be paid extra at the rates laid down under clause 20.0 of the general conditions of contract, if the extra work was ordered by the Chairman, Department of Civil Engineering. If the contractor should excavate the trench to a greater depth than is required without a specific order to that effect in writing, the extra depth shall have to be filled up with concrete at the contractor's own cost to the requirements and satisfaction of the Chairman, Department of Civil Engineering.
- 8.4 Refilling: After the pipes or other fittings has been laid and proved to be water tight, the trench or other excavation shall be refilled. Utmost care shall be taken in doing this, so that no damage shall be caused to the pipes and other permanent works. Filling in the trenches and up to 50cm above the pipes shall consist of the finest selected materials placed carefully and consolidated. After this has been laid, the trench and other excavation shall be refilled carefully in 15cm layers with materials taken from the excavation each layer being watered and consolidated.
- 8.5 Settlement and Damages: The contractor shall, at his own cost make good promptly, during the whole period the works are in hand, any settlement that may occur in the surfaces of roads, beams, footpaths, gardens, open spaces, etc., whether public or private caused by his trenches or by his other excavations and he shall be liable for any accidents caused thereby. He also shall at his own expenses and charge, repair and make good any damage to the buildings and other properties.

- 8.6 Disposal of surplus soil: The contractor shall at his own cost and charge, dispose within the site all surplus excavated material not required to be used on the works to within a distance of 50cm.
- 8.7 Timbering of pipe line and trenches: The contractor shall at all times support efficiently and effectively the sides of the pipe trenches and other excavations by suitable timbering, piling, sheering etc., without any extra cost. All timbering, sheeting and piling with their walling and supports shall be of adequate dimensions and strength and fully braced and strutted so that there is no risk of collapse or subsidence of the walls of the trench. The contractor shall be held accountable and responsible for the sufficiency of all timbering, bracing, sheeting and piling used and for all damages to persons and property resulting from the improper quality, strength, placing, and maintenance or removing of the same.
- 8.8 Removal of water from pipeline, trenches etc., : The contractor shall at all times during the progress of work keep the trenches and excavations free from water which shall be disposed of by him in a manner as will neither cause injury to the public health nor to the work completed or in progress nor to the surface of any roads or streets nor cause any interference with the use of the same.
- 8.9 The width of the excavated trench shall be as per the table given below width at bottom
- | | | |
|--------------------------------|------|-------|
| • Excavation up to 90cms depth | 33cm | 33cm |
| • 90 to 150cm depth | 60cm | 60cm |
| • 150 to 300cm depth | 75cm | 75cm |
| • 300 to 500cm depth | 90cm | 100cm |
- 8.10 Protection of existing services : All pipes, water mains, cables etc., met in the course of excavation shall be carefully protected and supported.
- 8.11 Concreting: All pipes at shallow road crossings and made up ground shall be laid on a bed of 15cm concrete with one part of cement, 4 parts of sand and 8 parts of 40mm gauge stone metal property consolidated. Concrete shall be laid to the full width of the trench and also in haunches.
- 8.12 CAST IRON PIPES AND FITTINGS
- 8.12.1 Cast – iron soil, waste and vent pipes and fittings shall be of heavy quality conforming to IS 1536-1967 and fittings to IS 1537-1960
- 8.12.2 Claying and Jointing: The pipes shall be laid, underground, under the floors, or on walls either buried or exposed as the case may be as shown on the drawings.
- 8.12.3 Cast Iron, Pipes: Cast iron pipes shall be laid and jointed in conformity with the code of practice for laying of cast iron pipes. Cast iron pipes shall be jointed by best quality caulking lead free from all impurities in wet trenches, joints shall be made with lead wool. The spigot shall be centered in the adjoining socket by tightly caulking in sufficient turns of tarred gaskin to leave unfilled the required depth of socket for lead. Where the gaskin has been caulking tightly home, a jointing ring shall be placed round and barrel and against the face of the socket. Molten lead shall then be poured into fill the remainder of the socket in one with suitable tools by hammering right-round the joint, to make up for the shrinkage of the molten metal on cooling and shall preferably finish 3mm behind the socket face. Lead for caulking shall conform to IS 782-1966. The quantity of lead to be filled per joint in various sizes of cast iron pipes. Shall be as follows:

Water main pipes	Lead /joint (Kg)
80mm (3") pipe	1.8
100mm (4") pipe	2.2
125mm (5") pipe	2.6

150mm (6") pipe	3.4
200mm (8") pipe	5.0

8.12.4 The joints and pipes laid for water supply systems shall be tested to a pressure of 12kg.sqcm for two hours without developing leaks/fall in pressure. The drainage pipelines and joints shall be tested to a head of 150cm for two hours without developing leaks/fall in pressure. In case of leaks the piping shall be redone in such portion and the test repeated till achieving satisfactory results.

8.12.5 Underground piping shall be of CI tyton type confirming to IS class A 1536 the piping shall be laid not less than 1Mt below the ground level. Suitable masonry/ PCC support anchor blocks shall be provided at change in direction with soil conditions are unsatisfactory.

8.12.6 All fittings shall be CI flanged confirming to IS 1538. The flanges shall be drilled as per relevant Indian Standards Flanges shall be faced and cleaned and shall have jointing of rubber insertion or asbestos compound. In case of tytronpipes the joint shall be made by using rubber gaskets as per manufactures specification. The joint shall be capable of withstanding a pressure of 10.5 Kg/Sqcm.

9.0 SLUICE VALVES

Sluice valves shall conform to IS: 780 valves shall be of right hand type. Only flanged valves shall be used . Valve wheel shall have an arrow engraved or cast thereon showing the direction of turning open or close operation.

10.0NON-RETURN VALVES

Non return valve shall be of cast iron with gun metal seat. Non return of valves shall be of flanged type. Spring loaded valves shall not be used. The valves shall be suitable for a test pressure of 21 kgs/Sqcm.

11.0 MODE OF MEASUREMENT

11.1 Excavation (General): the width of excavation shall be limited to as said earlier.

11.2 Cast iron pipes: Cast iron pipes shall be measured along the center line of the pipe including all specials in Rmt. The quoted rate for respective item shall be Rmt, and shall include the following:

- A. Cost of respective pipes and specials and jointing materials etc.,
- B. Laying fixing and jointing with necessary clamps, brackets, bolts, nuts and washers.
- C. Making good all damages to the parts of the building to suit the surroundings and making good the defects if any.
- D. Testing and making good the defects if any

Valves: Valves shall be per number only and shall include the following:

- A. Cost of valve and jointing materials
- B. Fixing and jointing with necessary bolts, nuts, rubber insertion etc.,
- C. Testing and making good the defects if any:

11.4 GI Pipes and Fittings:

The pipes shall be of the medium quality (class B) unless otherwise specified and shall be of galvanized iron, screwed socketed and shall conform to IS: 1239. They shall be

manufactured by a firm of repute. All fittings shall be malleable iron galvanized fittings of approved best Indian make.

11.4.1 LAYING AND FIXING

11.4.1 Where pipes have to be cut or re-threaded, ends shall be carefully cut so that no obstruction to bore is offered. For internal work all pipes and fittings shall be fixed truly vertical and horizontal either by means of standard pattern holder bat clamps keeping the pipes (12mm) clear of the wall everywhere or concealed as re-directed.

11.4.1.2 For external work, G.I pipes and fittings shall be laid in trenches. The width of the trench shall be the minimum width required for working. The pipes laid underground shall not be less than 60cms. From the finished ground level. The work of excavation and refilling shall be done as specified elsewhere or concealed as directed.

11.4.2 Painting : The burred pipes shall be painted with two coats of bit mastic paint.

11.4.3 Testing: Before any pieces are painted or covered, they shall be tested to a hydrostatic pressure of 7 kg/sqcm pressure shall be maintained for at least eight hours without appreciate drop in pressure, in addition to the sectional testing of water supply pipes, the contractor shall test the whole installation to the entire satisfaction of the Chairman, Department of Civil Engineering. He shall rectify any leakages, failure of fittings or valves.

11.4.4 Mode of measurements: G.I pipes above and below ground shall be measured along the center line of the pipes and fittings the quoted rate for respective item shall be per Rmt and shall include the following:

- a) Cost of respective pipes and specials
- b) Laying, fixing and jointing with necessary clamps
- c) Cutting hole and chases in walls floors, etc., and making good the same
- d) Testing and making good the defects if any.

NOTE: Contact Details of Independent External Monitors are Provided Below;

- Mr. Najib Shah, Ph no: 9311706358, Email ID: najibshah@hotmail.com
- Mr. MJ joseph, Ph No: 9560697979, Email ID: mohan.joseph@gamil.com

LIST OF APPROVED MAKES FOR CIVIL WORKS

Sl.No.	Item	Make
1	WINDOWS	
2	ALUMINIUM	JINDAL/INDAL INFRA/HINDAL CO
3	STEEL	TATA/SAIL/JINDAL/APOLLO.(to be procured from Primary producers)
4	DOORS	SAL WOOD DOOR WITH FLUSH SHUTTER, GRP LAMINATED DOORS
5	GLAZING	JOHNSON, KAJARIA
6	GLAZED TILES	JOHNSON, KAJARIA, NAVEEN
7	CERAMIC TILES	JOHNSON, KAJARIA, NAVEEN
8	PAINTS AND DISTEMPER	ASIAN BRAND, APEX BRAND
9	SYNTHETIC ENAMEL	ASIAN BRAND
10	WATER PROOFING COMPOUND	FOSROC, DR.FIXIT
11	VITRIFIED FLOORING	JOHNSON, KAJARIA
IF THE ABOVE BRAND IS NOT AVAILABLE THE EQUIVALENT MATERIAL TO BE APPROVED BY THE ENGINEER-IN-CHARGE BEFORE FIXING		
ALL MATERIAL SHALL HAVE TO BE GOT APPROVED FROM THE ENGINEER-IN-CHARGE BEFORE BEING USED.		

S. No.	ITEM	MAKE
LIST OF MAKES FOR CIVIL WORK/RECOMMENDED EQUAL QUALITY OF PRODUCT		
1.	RCC WORK	
a.	Cement	Ultra tech/ Ambuja Cement/Dalmia Bharat Cement/ ACC cement
b.	Aggregates (Course and Fine Aggregates)	As per IS and Mix design for concrete work or zone.
c.	TMT Bars	Tata Steel Ltd, Sail, Jindal steel & Power ltd, JSW steel ltd.
d.	Anchor Fasteners / Rebar	Hilti, Fischer, Wurth.
e.	Waterproofing/Admixture /plasticizers/ Grout / water Repellent/ Sealant	Pidilite, MYK Arment, Fosroc, Dr Fixit, Master builders Solutions
f.	PVC Water Stop	Fixopan, JyotiRubber Udyog (I) Ltd, Sandhya enterprises
g.	GI Pipe	Tata, Jindal, Zenith
h.	Anti-Termite	Pest Control India (PCI), Bayer, Hindustan insecticide.
i.	Ceramic Tiles	Somany, H&RJohnson, RAK, Kajaria.
J.	Epoxy Resin Based Concrete Bonding Agent	Fosroc, MYK Arment, Pidilite, Master builders Solutions.
k.	Perforated Pipe	Astral , Supreme.
	Sanitary Fittings	CERA/Jaguar/PARRYWARE/HINDWARE
l.	FRP Manhole Cover	Amrock, Fibrocast, Everlast
2.	STRUCTURAL STEEL WORK	
a.	Structural Rolled Steel sections- beams, channels, Tee, flats, angles, bars (round, square, hexagonal)	Tata steel limited, SAIL, Jindal steel & Power ltd, JSW Steel Ltd.
b.	Structural Hollow, steel Tubular sections	Tata steel Limited, Jindal steel & Power Ltd, SAIL, JSW Steel Ltd.(to be procured from Primary producers)
c.	Decking Sheet	Tata Blue Scope , JSW – Jindal.
d.	Welding Rods	Advani, Esab, Victor, D&H Norma.
e.	Fire Proof Spray (Vermiculite)	Newkem , Berger - Promat , Carboline
f.	Fire Proof Paint (Intumescent)	Berger, Jotun, Carboline, Newkem
g.	Primer Prior to Fire proof paint/Spray	Berger, AsianPPG, Jotun, Carboline
h.	Paint	Berger, Asian, Jotun
i.	Non Shrink High Strength Grout	Fosroc , MYK Arment , Pidilite, Master builders Solutions

BOQ

BOQ
Civil Works

IISC_TEST FACILITY_CIVIL WORK

Sl No.	Ref No.	Methodology/Description of Work	Unit	Qty
A		Site Clearing for the Project Area		
1	PWD SR Vol.1 , 1.1 , pg 05	Earth work in surface excavation for stripping, seating of bund, Road way, by manual means for lowering & leveling the ground for all works other than foundation & depth in all kinds of soil not exceeding 300mm as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter including dressing of excavated surfaces, disposing off or levelling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m and lift upto 1.5 m including cost of labour, tools, usage & other appurtenances required to complete the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Sqm	1144
B		Furnace building - 10.8m x 11.6m		
1	PWD SR Vol.1 , 1.6.1, pg 06	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (inculding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour, tools, usage& other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.50m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	151
2	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	125.28
3	PWD SR Vol.1 1.1, pg 07	Supplying and filling in plinth with sand under floors, foundation of Bridges including watering, ramming, consolidating and dressing complete. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - under machine foundation	cum	55
		Anti-Termite Treatment		
4	PWD SR Vol.2, 4.1, pg 05	Providing and injecting chemical emulsion for Pre-constructional Anti-Termite Treatment , creating continuous chemical barrier under and around the column pits, walls, trenches, basement excavation, top surface of the plinth filling, junction of wall and floor, along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid, surrounding of pipes and conduits with Chlorpyriphos 20% E.C. / Lindane 20% E.C. @ 3.19 ltr/m2 including cost of chemical, diluting in water to one percent concentration, labour, usage charges of machinery, complete as per specifications.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	132
		PCC		

5	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1 for formwork sl.no-1a, pg 115(5364+3%)= 5524.92, AW= 10%+5524.92=6077.41	PCC Work- PCC in Bed 1:4:8 @ depth of 1.5m from GL of thickness 75mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	16.5
		Stone masonry		
6	PWD SR Vol.2,5.1.1, pg 9	Providing Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20 mm nominal size) upto plinth level with :Cement mortar 1:6 (1 cement : 6 coarse sand). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	14
		RCC		
7	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-2, pg 115(6299+5%)= 6613.95, AW= 10%+6613.95=7275.25	Providing and laying in position Reinforced cement concrete (RCC) for all Sub structures of building, Irrigation works, Sub structure works of footing, strong floor, upto below plinth beam , bridges, Drain works & other parallel works . The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately). Also, necessary compacting / ramming of the earth to be considered for costing.Expansion joints / strip to be considered at regular intervals for the internal road. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	96
8	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-8, pg 115(6299+10%)= 6928.9	Providing and laying in position Reinforced cement concrete (RCC) for all super structures of building, Irrigation works, super structure works of columns/ beams, bridges, Drain works & other parallel works from 0.450m to 3.65 m height . The granite / trap / basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	16.5

9	PWD SR Vol.1, 2.4.3, pg 17 & appendix 1 for formwork sl.no-8, pg 115(6299+10%)= 6928.9	Providing and laying in position Reinforced cement concrete (RCC) for all super structures of building, Irrigation works, super structure works of columns/ beams, bridges, Drain works & other parallel works from 3.65m to 7.2 m height . The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges	cum	18
10	PWD SR Vol.1, 2.4.3, pg 17 & appendix 1 for formwork sl.no-8, pg 115(6299+10%)= 6928.9	Providing and laying in position Reinforced cement concrete (RCC) for all super structures of building, Irrigation works, super structure works of columns, bridges, Drain works & other parallel works from 7.2m to 11.50m height . The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	22.6
		Steel		
11	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	Kgs	4943
		MS Work		
12	Vol. II/11.16.2, pg.81	Providing and fixing Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	2870
13	PWD SR Vol.2, 11.34A, pg 85	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to steel windows by welding for window grills, gates. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	286
		Brick work		
14	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. +0.45m to 3.65m height .	cum	28

15	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.6m to 7.2m height.	cum	34
16	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 7.2m to 11.5m height.	cum	29.5
		Internal Plastering		
17	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in horizontal and vertical surfaces with two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. +0.45m to 3.65m height.	sqm	155
18	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.65m to 7.2m height.	sqm	197
19	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 7.2m to 11.5m height.	sqm	180
		Exterior plastering		
20	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to 3.65m height.	sqm	188

21	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.65m to 7.2m height.	sqm	161
22	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 7.2m to 11.5m height.	sqm	172
		Flooring		
		Epoxy flooring		
23	SOR 2017-18 - DOS H316 pg no 179	Providing and laying self –leveling hard epoxy flooring (Non ESD flooring) using NITOFLOOR SL2000 of approved colour of M/s FOSROC Chemicals or equivalent by preparing the surface of floor by captive shot (using lead shots) blasting followed by vacuum cleaning to receive the flooring and laying the floor having the following specifications and as per directions of Engineer in charge. A Primer coat of Nitoprime25 is applied on the prepared concrete surface using felt rollers and time shall be allowed for the solvent to evaporate to form a tacky surface for the floor topping. Providing and applying self smoothing epoxy resin floor topping using Nitoflor SL2000, at 2mm thickness to provide a hard-wearing, the topping shall achieve a minimum compressive strength of 50 N/mm2 and a flexural strength of 34 N/mm2 at 7 days when tested to BS6319. Shore D Hardness as per (ASTM D2240) : 80. At 200 C, it shall be capable of accepting foot traffic st 24 hours and vehicular traffic at 48 hours, as a final finish to the floor. Application : Application of flooring system only when the moisture levels in concrete is less than 5% (or RH level to be < 75%) when tested using a thermo hygrometer all as per specification and direction of Engineer in charge.	sqm	126
		VDF		
24	SOR 2017-18 - DOS H320 pg. no 180	Extra for Vaccum dewatering process for RCC floor including hiring dewatering equipments, conveying to site and executing the work and finishing the surface to receive the respective floor finish and to required standards all as per standard specifications and directions of Engineer in charge.	sqm	126
25	SOR 2017-18 - DOS HM060D pg no - 181	Providing and laying Indian Patent Stone Flooring with cement concrete 1:2:4 (cement : msand : graded stone aggregate) using graded granite stone aggregate obtained from approved quarry laid to level or slope in bays not exceeding 3sqm per panel including providing 3mm thick aluminium dividing strips to the full depth of the flooring and finished smooth with float coat of cement at 4.4kg/sqm, curing, etc., complete all as per specifications. 50mm thick (using 20mm nominal size stone aggregate)	sqm	126

26	PWD SR Vol.2,9.3 pg64	Providing and laying flooring and steps fine machine polished granite stone slabs 20 mm thick on cement mortar bed 1:6, 20 mm thick, and joints finished with cement mortar 1:3 over existing cement concrete bed , including cost of materials, mortar, labour, curing complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including nosing (Black granite)	sqm	12
27	PWD SR Vol.2,9.29 pg64	Providing and laying flooring and steps fine dressed granite stone slabs 40 mm thick on cement mortar bed 1:6, 25 mm thick, and pointed with cement mortar 1:3 over existing cement concrete bed , including cost of materials, mortar, labour, curing complete as per specifications. including nosing (black granite). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
		Putty		
28	PWD SR Vol.2,8.51, pg50	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete as per specifications and as per directions of Engineer in charge. (2 Coats) . All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including scaffolding. 0m to 14m height.	sqm	510
		Painting		
		Internal painting		
29	PWD SR Vol.2,8.32, pg46	Finishing walls with 100% Premium acrylic emulsion paint of interior grade having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives, New work (Two coats applied @ 1.43 litre/ 10 m ² . Over and including priming coat of exterior primer applied @ 0.90 litre/10 m ² with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	sqm	510
		External painting		
30	PWD SR 18-19, 15.015, pg 128	Providing and applying Premium Acrylic exterior paint of approved quality, colour and shade to wall surface after cleaning and rubbing the wall surface with wire brush of medium size emery stone to remove all the loosely adhering particles, the surface is then cleaned with water and ensured that it is in line and level. The textured material is then mixed with 40-50% of clean water until a homogeneous thick slurry is formed, the slurry is left for 5-10 min, to react completely with ingredients. The textured finish prepared as above is then applied to the wall surface with suitable roller/spraygun/putty/ blade/ trowel to get the desired finish. The finished surface shall be applied with two coats of exterior paint of approved shade. The rate includes providing and removing scaffolding, all lead and lift and all other incidental charges etc., Complete as per directions of the Engineer-in-charge of the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	589
31	PWD SR Vol.2,8.40, pg48	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (Metal/ Wood)	sqm	756

32	PWD SR Vol.2,8.29, pg45	Finishing walls with textured exterior paint of required shade : New work (Two coats applied @ 3.28 ltr/10 m ²) over and including priming coat of exterior primer applied @ 2.20kg/10 m ² to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. 0m to 14m height	sqm	280
		Rolling shutters		
33	PWD SR Vol.2, 11.6.1, pg 76	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters. 80x1.25 mm M.S. laths with 1.25 mm thick top cover including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including gear lever for two sides.	sqm	26
		Doors		
34	PWD SR Vol.2, 26.2, pg 201/MR	Double Leaf doorset - Insulated Fire rated doorset (FD 120) - Staircase / exit pathway application / Refuge area.Providing and fixing of ISI marked fire doors as per IS 3614:2021, 120 minutes fire rating with 30 minutes insulation double leaf doorset tested to IS/ISO 3008. Doorset shall include grooved step frame profile of 125x75mm, made of 1.2mm GI (120GSM) and 60mm thick shutter made of 1.2mm GI (120GSM) with infill of 120kg density mineral wool. Grooved frame shall include EPDM smoke seal. Include hardwares, minimum 6nos SS ball bearing hinges of SS304 100x89x3mm, 1no of Single point Panic device and external trim with key cylinder on active leaf and 1no two point Panic device on the inactive leaf, tested as per EN1125 and CE marked. 2no of Door closer with spring size of EN 3-5, as per EN1154 and CE marked. 1no door coordinator for sequencing. 2nos vision panel 200 x 300 with 6mm clear fire rated glass and finished in desired colour of powder coating not less than 50microns including suitable anchors & fire rated puff grouting all inclusive for fixing of doorset - for staircase / exit pathway / Refuge area applications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.		
		FD1 - 1800x2400mm	no's	1
		Windows & Ventilators		
35	PWD SR Vol.2, 12.90, pg 112	Providing & fixing of 3-track x 2-panel sliding windows made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO ₂ (Titanium Dioxide) at 6PHR with TPE(Thermo Plastic Elastomer) and lead free, gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the window frame. The outer frame having an overall size of 108mm width x 45mmheight with reinforcement of 1mm thickness and Sash with overall size of 39mm x 75mm with GI reinforcement of 2mm and mesh sash of size 37mm x 58mm. Coextruded Glazing bead for fixing of glass shall be of size 20mm x 24 mm. Windows shall be provided with 6mm plain float glass , standard hardware& Multi point locking system with touch lock. Wall thickness of frame & sash shall be of 2mm-2.5mm. Maximum possible size – 2419mm x 2200mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6

36	PWD SR Vol.2, 12.91, pg 112	Providing & fixing of Openable window made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO ₂ (Titanium Dioxide) at 6PHR with TPV(Thermo Plastic Vulcanized) and lead free with gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the openable frame. The frame having overall size of 60mm x 55mm with GI reinforcement of 1mm thickness and openable sash with overall size of 60mm x 75mm and GI reinforcement of 1.5mm thickness. Coextruded Glazing bead for fixing of glass shall be of size 20mm x 34 mm. Windows shall be provided with 5mm plain float glass, Standard hardware with friction hinge & Multi point locking system with Handle. Wall thickness of frame & sash shall be of 2mm-2.5mm. Maximum possible size – 900mm x 1819mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	2
37	PWD SR Vol.2, 12.85, pg 110	Providing & fixing of louvered ventilator made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO ₂ (Titanium Dioxide) at 6PHR with TPE (Thermo Plastic Elastomer) and lead free with gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the ventilator frame. The frame having overall size of 39mm x 39mm with GI reinforcement of 1mm thickness. Louver clip in Aluminium (powder coated in white) will be used on the frame along with plastic parts for fixing the 4 mm pin head glass. Wall thickness of frame shall be 2mm. Maximum possible size - 1000mm x 1000mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	60
		Roofing		
38	Market survey	Roofing panel - Prefabricated Insulated Roofing Panels - PIR insulated sandwich panel 50mm thick of 0.4/0.35mm Galvalume sheet on both sides with Polyurethane Foam (puf) with PU foamer spray density 35+/-5 kg/m ³ sloping roof as per profile. The rate shall include the flashing at necessary locations, roof ridge / apex panel, Gable ends, Gable trim, eve end trims, hardwares, etc., Including scaffolding. The quote shall include PVC profiled rain gutters of suitable shape & size with necessary supporting brackets. Downtake pipe - PVC Downtake pipe 100mm dia upto ground with necessary connecting joints etc., All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	165
		Core cutting		
39	CPWD, SR, Vol 2, 18.76 pg, 1656	Cutting holes up to 30x30 cm in walls including making good the same, including bore packing with cement water 1: 2: 4. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Nos	2

IISC_TEST FACILITY_CIVIL WORK

Sl No.	Ref No.	Methodology/Description of Work	Unit	Qty
C		Control building - 6.26 x 10.72m		
1	PWD SR Vol.1 , 1.6.1, pg 06	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (including rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.6 m including cost of labour, tools, usage & other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.60m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	35
2	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	21
3	PWD SR Vol.1 1.1, pg 07	Supplying and filling in plinth with sand under floors, foundation of Bridges including watering, ramming, consolidating and dressing complete. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	12
		Anti-Termite Treatment		
4	PWD SR Vol.2, 4.1, pg 05	Providing and injecting chemical emulsion for Pre-constructional Anti-Termite Treatment , creating continuous chemical barrier under and around the column pits, walls, trenches, basement excavation, top surface of the plinth filling, junction of wall and floor, along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid, surrounding of pipes and conduits with Chlorpyrifos 20% E.C. / Lindane 20% E.C. @ 3.19 ltr/m ² including cost of chemical, diluting in water to one percent concentration, labour, usage charges of machinery, complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	39.5
		PCC		
5	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1 for formwork sl.no- 1a, pg 115(5364+3%)= 5524.92, AW= 10%+5524.92=60 77.41	PCC Work- PCC in Bed 1:4:8 @ depth of 1.6m from GL of thickness 150mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	2.08

		RCC		
6	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-8, pg 115(6299+10%)= 6928.9	Providing and laying in position Reinforced cement concrete (RCC) for all super structures of building, Irrigation works, super structure works of columns/ beams, bridges, Drain works & other parallel works. The granite / trap / basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	42.6
7	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-8, pg 115(6299+10%)= 6928.9	Providing and laying in position Reinforced cement concrete (RCC) for all super structures of building, Irrigation works, super structure works of columns/ beams, bridges, Drain works & other parallel works from 3.50m to 7.0 m height . The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges	cum	7
		Steel		
8	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	Kgs	4316
		MS Work		
9	PWD SR Vol.2, 11.34A, pg 85	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to steel windows by welding for window grills, gates, ladders etc., All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	238
8	Vol. II/11.16.2, pg.81	Providing, fabricating and fixing Steel work in built up tubular (round, square or rectangular hollow tubes, sheets etc.) ladders etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - ladder & closing shutter for cut out to be considered	Kgs	116
		Stone masonry		

10	PWD SR Vol.2,5.1.1, pg 9	Providing Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20 mm nominal size) upto plinth level with :Cement mortar 1:6 (1 cement : 6 coarse sand). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	2.5
Brick work				
11	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to 3.5m height.	cum	38
12	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.5m to 7m height.	cum	4
Internal Plastering				
13	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in horizontal and vertical surfaces with two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to 3.5m height.	sqm	393
14	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.5m to 7m height.	sqm	48
Exterior plastering				
15	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to 3.5m height.	sqm	164

16	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 3.5m to 7m height.	sqm	46
		Flooring		
17	PWD SR Vol.2,9.19 pg62	Providing and laying Vitrified tiles for flooring and dadoing (Control room, toilets and different areas as specified in the drawing) of different sizes (thickness to be specified by the manufacturer), with water absorption less than 0.08% and conforming to IS: 15622, of approved brand & manufacturer, in all colours and shade, in skirting, riser, treads of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS: 15477, in average 6 mm thickness, including grouting of joints as per direction of Engineer in charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	181
18	PWD SR Vol.2,9.3 pg64	Providing and laying flooring and steps fine machine polished granite stone slabs 20 mm thick on cement mortar bed 1:6, 20 mm thick, and joints finished with cement mortar 1:3 over existing cement concrete bed , including cost of materials, mortar, labour, curing complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including nosing (Black granite)	sqm	10
19	PWD SR Vol.2,9.29 pg64	Providing and laying flooring and steps fine dressed granite stone slabs 40 mm thick on cement mortar bed 1:6, 25 mm thick, and pointed with cement mortar 1:3 over existing cement concrete bed , including cost of materials, mortar, labour, curing complete as per specifications. including nosing (black granite). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
		Water proofing		
20	PWD SR Vol.2, 15.1, pg 133	Providing and laying Water proofing treatment to the Roof with PU based single component elastomeric pure polyurethane based coating on New terrace/Chajjas/Sunken portion of WC:Bathroom, cold applied PU waterproofing membrane that is highly elastic with elongation greater than 400% and tensile strength greater than 2MPa as per ASTM D412. The waterproofing membrane to be applied in 2coats @ 1.6kg per m2 to achieve final DFT (dry film thickness) of 1mm including prime coat of epoxy primer @150 g per m2 and protection with 120gsm Geo-textile over the waterproofing membrane. The finished cost to include surface preparation, making coving at Junction, Bore Packing, treatment of construction joints completely as per specification & with a 10 years warranty on product & work from certified manufacturers as per the direction of the Engineer In charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	157
		Core cutting		

21	CPWD, SR, Vol 2, 18.76 pg, 1656	Cutting holes up to 30x30 cm in walls including making good the same, including bore packing with cement water 1: 2: 4. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Nos	2
		Putty		
22	PWD SR Vol.2,8.51, pg50	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete as per specifications and as per directions of Engineer in charge. (2 Coats) . All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including scaffolding. 0m to 14m height.	sqm	315
		Painting		
		Internal painting		
23	PWD SR Vol.2,8.32, pg46	Finishing walls with 100% Premium acrylic emulsion paint of interior grade having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives, New work (Two coats applied @ 1.43 litre/10 m ² . Over and including priming coat of exterior primer applied @ 0.90 litre/10 m ² with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	sqm	441
		External painting		
24	PWD SR 18-19, 15.015, pg 128	Providing and applying Premium Acrylic exterior paint of approved quality, colour and shade to wall surface after cleaning and rubbing the wall surface with wire brush of medium size emery stone to remove all the loosely adhering particles, the surface is then cleaned with water and ensured that it is in line and level. The textured material is then mixed with 40-50% of clean water until a homogeneous thick slurry is formed, the slurry is left for 5-10 min, to react completely with ingredients. The textured finish prepared as above is then applied to the wall surface with suitable roller/spraygun/putty/ blade/ trowel to get the desired finish. The finished surface shall be applied with two coats of exterior paint of approved shade. The rate includes providing and removing scaffolding, all lead and lift and all other incidental charges etc., Complete as per directions of the Engineer-in-charge of the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	210
25	PWD SR Vol.2,8.25, pg45	Distempering with oil bound washable distemper for internal and external surfaces of approved brand and manufacture to give an even shade: New work (two coats) over and including water thinnable priming coat with cement primer after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. 0m to 14m height. - Including underground water tank	sqm	126

26	PWD SR Vol.2,8.40, pg48	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (Metal/ Wood)	sqm	91
27	PWD SR Vol.2,8.29, pg45	Finishing walls with textured exterior paint of required shade : New work (Two coats applied @ 3.28 ltr/10 m ²) over and including priming coat of exterior primer applied @ 2.20kg/10 m ² to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	sqm	136
		Doors		
28	PWD SR Vol.2, 26.1, pg 200/MR	Single Leaf doorset - Insulated Fire rated doorset (FD 120) - Staircase / exit pathway application / Refuge area. Providing and fixing of ISI marked fire doors as per IS 3614:2021, 120 minutes fire rating with 30 minutes insulation single leaf doorset tested to IS/ISO 3008. Doorset shall include grooved step frame profile of 125x75mm made of 1.2mm GI (120GSM) and 60mm thick shutter made of 1.2mm GI (120GSM) with infill of 120kg density mineral wool. Grooved frame shall include EPDM smoke seal. Include hardware, minimum 3nos SS ball bearing hinges of SS304 of size 100x89x3mm, 1no of Single point Panic device and external trim with key cylinder tested as per EN1125 and CE marked. 1no of Door closer with spring size of EN 3-5, as per EN1154 & CE marked. vision panel 200 x 300 with 6mm clear fire rated glass and finished in desired colour of powder coating not less than 50microns including suitable anchors & fire rated puff grouting all inclusive for fixing of doorset - for staircase / exit pathway / Refuge area applications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.		
		FD2 - 1200x2400mm	no's	2
29	PWD SR Vol.2,12.57.5, pg 106	Providing and fixing flush door shutter made out of solid core block board type, well seasoned, chemically treated hard wood battens and internal frame with minimum 45 mm wide wooden frame around door shutters covered with cross bonded wooden sheets (core veneer) hot pressed and fastened on both sides of the door using liquid phenol formaldehyde resin as per IS specifications 2202 (part-I) 1991 from manufacturer complete as per specification. 35 mm thick one side teak and one side commercial. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.		
		D1 - 900x2400mm	sqm	9.6
30	Market survey	Providing and fixing WPC Solid Door Frame - WPC (Wood & Polymer Composite) Door Frame of size 100mmx50mm to profile with 25mm thick shutter. WPC Door Frame Density 1.08/cm ³ . The colour of the shutter as per approval.		
		TD1 - 750x2400mm	sqm	7.2

31	PWD SR Vol.2,11.52, pg 93	Providing and fixing 12mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & double acting hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc. to be paid separately) including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.		
		GD1 - 900 x 2400mm	Sqm	2.16
32	PWD SR Vol.2,12.4, pg 99	Providing Sal wood wrought and putup for purlins, common rafters and similar work including cost of materials, labour, usage charges complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	2.2
33	Approved Data Rate-7	For Fixed Windows: Providing and fixing of Fixed windows UPVC Sections outerframe size of 50x60 with DPDM Gaskets having isolated water drain system and with full reinforcement. windows shall provided with 4mm clear glass. Including cost of All materials, Supplying, installation, transport and Labor. The rate shall be inclusive of all taxes and GST etc. and work shall be carried out as per the technical specifications and instructions of Engineer in charge.- FOR ALL FLOORS. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
		Windows & Ventilators		
34	PWD SR Vol.2, 12.90, pg 112	Providing & fixing of 3-track x 2-panel sliding windows made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO2(Titanium Dioxide) at 6PHR with TPE(Thermo Plastic Elastomer) and lead free, gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the window frame. The outer frame having an overall size of 108mm width x 45mmheight with reinforcement of 1mm thickness and Sash with overall size of 39mm x 75mm with GI reinforcement of 2mm and mesh sash of size 37mm x 58mm. Coextruded Glazing bead for fixing of glass shall be of size 20mm x 24 mm. Windows shall be provided with 6mm plain float glass , standard hardware& Multi point locking system with touch lock. Wall thickness of frame & sash shall be of 2mm-2.5mm. Maximum possible size – 2419mm x 2200mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Ventilators as per detail drawing.	sqm	22.4

35	PWD SR Vol.2, 12.91, pg 112	Providing & fixing of Openable window made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO2(Titanium Dioxide) at 6PHR with TPV(Thermo Plastic Vulcanized) and lead free with gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the openable frame. The frame having overall size of 60mm x 55mm with GI reinforcement of 1mm thickness and openable sash with overall size of 60mm x 75mm and GI reinforcement of 1.5mm thickness. Coextruded Glazing bead for fixing of glass shall be of size 20mm x 34 mm. Windows shall be provided with 5mm plain float glass, Standard hardware with friction hinge & Multi point locking system with Handle. Wall thickness of frame & sash shall be of 2mm-2.5mm. Maximum possible size – 900mm x 1819mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
37	PWD SR Vol.2, 12.85, pg 110	Providing & fixing of louvered ventilator made out of multi chambered UPVC (Matching to RAL-9016) sections and with minimum TiO2 (Titanium Dioxide) at 6PHR with TPE (Thermo Plastic Elastomer) and lead free with gaskets -grey colour having isolated drainage and reinforced with Galvanized Iron profile through-out the ventilator frame. The frame having overall size of 39mm x 39mm with GI reinforcement of 1mm thickness. Louver clip in Aluminium (powder coated in white) will be used on the frame along with plastic parts for fixing the 4 mm pin head glass. Wall thickness of frame shall be 2mm. Maximum possible size - 1000mm x 1000mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
36	Approved Data Rate-7	For Fixed Windows: Providing and fixing of Fixed windows UPVC Sections outerframe size of 50x60 with DPDM Gaskets having isolated water drain system and with full reinforcement. windows shall provided with 4mm clear glass. Including cost of All materials, Supplying, installation, transport and Labor. The rate shall be inclusive of all taxes and GST etc. and work shall be carried out as per the technical specifications and instructions of Engineer in charge.- FOR ALL FLOORS. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	6
		Interiors		
37	PWD SR 18- 19,39.15.3, pg 333	STRAIGHT WORKSTATION (Frame): Providing and fixing STRAIGHT WORKSTATION (Frame) consisting of back to back unit made out of MS CRCA powder coated, tile based system for main and return spine, Top tile finish 8 mm thick MDF covered with Fabric of approved colour and one writing board (600 mm W) and one soft board (600mm W) per workstation, Bottom tile finish 9 mm thick Laminate tile of approved colour, Raceway- one middle raceway (600mm W) below table top per workstation and continous raceway at the skirting level, Wire manager- ABS plastic grommet one number per table,Table top - 25 mm thick PLPB with straight table top End Table 25 mm thick PLPB with straightedge bound Hardware-M powder coated corner bkt,cantilever bkt,separator hook on bkt, L bkt and Table joint plate., as per specifications, drawings and as directed by Engineer in charge. Non Sharing workstation: 2 C) Size : 1200 mmW x 600mm D x 1200 mm ht (Non Sharing work station with Edge binding table top, Single unit)	Nos	3

39	Vocuher+ CP	Provision for office chairs, sofa, etc	L/H	
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IISC_TEST FACILITY_CIVIL WORK

SI No.	Ref No.	Methodology/Description of Work	Unit	Qty
D		Pump room (8m x 6m) & underground sump - 3m x 8m		
1	PWD SR Vol.1 , 1.6.1, pg 06	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (inculding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour, tools, usage& other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.50m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	154.5
2	PWD SR Vol.1 , 1.6.1, & 1.6.2 pg 06, 07,depth 1.5m to 3m	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (inculding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m to 3m including cost of labour, tools, usage & other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.50m to 3.00m. All works complete as per the drawing, technical specification & direction of the Engineer in-charge.	cum	153
3	PWD SR Vol.1 , 1.6.1, & 1.6.2 pg 06, 07,depth 3m to 4.5m	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (inculding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 3m to 4.5m including cost of labour, tools, usage& other appurtenances required to complete the work. In all kinds of soils. Depth upto 3m to 4.5m. All works complete as per the drawing, technical specification & direction of the Engineer in-charge.	cum	153
4	PWD SR Vol.1 , 1.6.1, & 1.6.2 pg 06, 07	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (inculding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 4.5m to 6.0m including cost of labour, tools, usage& other appurtenances required to complete the work. In all kinds of soils. Depth upto 4.5m to 6.0m. All works complete as per the drawing, technical specification & direction of the Engineer in-charge.	cum	153

5	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	161.5
		PCC		
6	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1for formwork sl.no-1a, pg 115(5364+3%)=5524.92, AW=10%+5524.92=6077.41	PCC Work- PCC in Bed 1:4:8 @ depth of 1.5m from GL of thickness 75mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - including coping on top of compound wall	cum	29.55
		Steel		
7	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	Kgs	9520
		MS Work		
8	Vol. II/11.16.2, pg.81	Providing, fabricating and fixing Steel work in built up tubular (round, square or rectangular hollow tubes, sheets etc.) Metal doors, ladders etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - ladder & closing shutter for cut out to be considered	Kgs	927
		RCC		
9	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-2, pg 115(6299+5%)=6613.95, AW=10%+6613.95=7275.25	Providing and laying in position Reinforced cement concrete (RCC) for all Sub structures of building, Irrigation works, Sub structure works of footing, strong floor, upto below plinth beam , bridges, Drain works & other parallel works. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately). Also, necessary compacting / ramming of the earth to be considered for costing.Expansion joints / strip to be considered at regular intervals for the internal road. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	118.5
		Brick work		

10	PWD SR Vol.2,6.6, pg 13	Providing Brick work with common burnt clay machine moulded perforated bricks of class designation 5.0 conforming to IS: 2222 in superstructure above plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) With Modular bricks including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. +0.45m to 3.65m height.	cum	2.5
		Internal Plastering		
11	PWD SR Vol.2,8.9, pg42	Providing 18 mm cement plaster in horizontal and vertical surfaces with two coats. Under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to -6m height. Including for UG sump/ slab	sqm	312
		Exterior plastering		
12	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing compound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	90
		Water proofing		
13	PWD SR Vol.2, 15.7, pg 134	Providing and supplying crystalline integral concrete waterproofing admixture that waterproofs concrete by forming crystals deep in the pores, capillaries and microcracks of the concrete, self-seal waterproof ing compound to bridge shrinkage cracks upto 0.5mm in width & resist hydro-static pressure upto 16bar for both positive & negative pressure confirming to DIN 1048 part 5 for 56% reduction in depth of penetration against control, resistance to chloride penetration confirming to ASTM C 1202 with 64% improvement against control & protecting steel re inforcement against corrosion mixed @ 1% by weight of cementitious content in concrete. ie., integral crystalline waterproofing admix @ 0.55 kg/bag of cement. (For calculation purpose 340 kg of Cement for M-25 grade of Concrete is considered in the analysis). for UG sump . All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	362
		Painting		
		Internal painting		
14	PWD SR Vol.2,8.32, pg46	Finishing walls with 100% Premium acrylic emulsion paint of interior grade having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives, New work (Two coats applied @ 1.43 litre/ 10 m ² . Over and including priming coat of exterior primer applied @ 0.90 litre/10 m ² with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	sqm	312
		External painting		

15	PWD SR 18-19, 15.015, pg 128	Providing and applying Premium Acrylic exterior paint of approved quality, colour and shade to wall surface after cleaning and rubbing the wall surface with wire brush of medium size emery stone to remove all the loosely adhering particles, the surface is then cleaned with water and ensured that it is in line and level. The textured material is then mixed with 40-50% of clean water until a homogeneous thick slurry is formed, the slurry is left for 5-10 min, to react completely with ingredients. The textured finish prepared as above is then applied to the wall surface with suitable roller/spraygun/putty/ blade/ trowel to get the desired finish. The finished surface shall be applied with two coats of exterior paint of approved shade. The rate includes providing and removing scaffolding, all lead and lift and all other incidental charges etc., Complete as per directions of the Engineer-in-charge of the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	93
		Core cutting		
16	CPWD, SR, Vol 2, 18.76 pg, 1656	Cutting holes up to 30x30 cm in walls including making good the same, including bore packing with cement water 1: 2: 4. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Nos	4

IISC_TEST FACILITY_CIVIL WORK

SI No.	Ref No.	Methodology/Description of Work	Unit	Qty
E		Compound wall		
1	PWD SR Vol.1 , 1.6.1, pg 06	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (including rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour, tools, usage & other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.50m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	85
2	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	35
		PCC		
3	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1for formwork sl.no- 1a, pg 115(5364+3%)= 5524.92, AW= 10%+5524.92=6077. 41	PCC Work- PCC in Bed 1:4:8 @ depth of 1.5m from GL of thickness 75mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - including coping on top of compound wall	cum	12.9
		Stone masonry		
4	PWD SR Vol.2,5.1.1, pg 9	Providing Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20 mm nominal size) upto plinth level with :Cement mortar 1:6 (1 cement : 6 coarse sand). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	32
		Steel		
5	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	Kgs	522
		RCC		

6	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-2, pg 115(6299+5%)=6613.95, AW=10%+6613.95=7275.25	Providing and laying in position Reinforced cement concrete (RCC) for all Sub structures of building, Compound wall columns , Irrigation works, Sub structure works of footing, upto below plinth beam , bridges, Drain works & other parallel works. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately). Also, necessary compacting / ramming of the earth to be considered for costing.Expansion joints / strip to be considered at regular intervals for the internal road. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	29
		Brick work		
7	DOS - SOR-2017-18 B202 . pg 96	Providing and constructing BRICK MASONRY in cement mortar 1:6 (cement : coarse river sand) using well burnt WIRE CUT bricks with "RAT TRAP BOND" including raking out joints 10mm deep, to have exposed finish with sunk pointing, curing, shoring / scaffolding, etc., including toothing / bonding with cross walls of normal brick work (built with class 3.5 bricks minimum average compressive strength not less than 3.5N/sqmm) and provision of two nos., 10G (3.15mm dia) MS wire dowels 200mm long each at every 3rd course at junction of main wall and cross wall etc., complete all as per specifications and drawings and as per direction of engineer-in-charge. [NOTE: 1) Sunken pointing will be measured separately and paid elsewhere as in item. 2) Solid brick masonry around opening such as doors, windows, ventilators to be provided and the quoted rate should include the same and no extra will be permissible on account of this. 3) Rate is inclusive of cost of the MS wire dowels, toothing and bonding.] for superstructure up to floor five level including scaffolding, etc.	cum	55
		Plastering		
8	PWD SR Vol.2,8.3.2, pg41	Providing 20 mm cement plaster of mix :1:6 (1 cement: 6 fine sand) to brick/stone masonry for external surface with water proofing coumpound, spong finish, grooves, drip mould, including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. 0m to 3.65m height.	sqm	568
		Painting		

9	PWD SR 18-19, 15.015, pg 128	Providing and applying Premium Acrylic exterior paint of approved quality, colour and shade to wall surface after cleaning and rubbing the wall surface with wire brush of medium size emery stone to remove all the loosely adhering particles, the surface is then cleaned with water and ensured that it is in line and level. The textured material is then mixed with 40-50% of clean water until a homogeneous thick slurry is formed, the slurry is left for 5-10 min, to react completely with ingredients. The textured finish prepared as above is then applied to the wall surface with suitable roller/spraygun/putty/ blade/ trowel to get the desired finish. The finished surface shall be applied with two coats of exterior paint of approved shade. The rate includes providing and removing scaffolding, all lead and lift and all other incidental charges etc., Complete as per directions of the Engineer-in-charge of the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	284
10	PWD SR Vol.2,8.29, pg45	Finishing walls with textured exterior paint of required shade : New work (Two coats applied @ 3.28 ltr/10 m ²) over and including priming coat of exterior primer applied @ 2.20kg/10 m ² to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. 0m to 14m height	sqm	284
		MS Work		
11		Gate - Providing and fixing of MS main gate (5 x 1.8m), Pedestrian gate (1.2x1.8m), Removable drain covers of size 600 x 600mm (for underground water tank), Metal ladders (down to pump room & underground water tank) etc., made with Metal fabrication work using different sizes of MS Box sections, flats, round pipes, sheets etc., Also, gate shall have sliding mechanism which is manually operated. The work shall be complete including necessary hardwares, fittings and fixture.	Kgs	464
12	PWD SR Vol.2,8.40, pg48	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (Metal/ Wood)	sqm	88.36

IISC_TEST FACILITY_CIVIL WORK

SI No.	Ref No.	Methodology/Description of Work	Unit	Qty
F		Casting yard - 5.77 x 16.34		
1	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	110
		Nominal Steel		
2	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	Kgs	1100
		PCC		
3	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1for formwork sl.no-1a, pg 115(5364+3%)= 5524.92, AW= 10%+5524.92=6077.41	PCC bed to slope - PCC in Bed 1:4:8 @ depth of 1.5m from GL of thickness 75mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. final layer to finish to the plumb level. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	22

IISC_TEST FACILITY_CIVIL WORK

SI No.	Ref No.	Methodology/Description of Work	Unit	Qty
G		Gas station		
1	PWD SR Vol.1 , 1.6.1, pg 06	Earth work excavation for pipelines/cables/ footings/ sump by Manual/ Mechanical means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (including rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour, tools, usage& other appurtenances required to complete the work. In all kinds of soils. Depth upto 1.50m. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	19
2	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	5
		PCC		
3	PWD SR Vol.1, 2.1.2, pg 62 & apendix 1for formwork sl.no- 1a, pg 115(5364+3%)= 5524.92, AW= 10%+5524.92=6077. 41	PCC Work- PCC in Bed 1:4:8 @ depth of 1.5m from GL of thickness 75mm. OPC @ 180 Kgs, 40mm & down size graded Granite metal coarse aggregate @ 0.85Cum & fine aggregates @ 0.57 cum machine mixed concrete laid in layers not exceeding 75 mm thick & well compacted. (1 cement :4 sand: 8 Aggregate) Providing cement mortar of mix 1:4:8 (1 cement :4 sand: 8 Aggregate) including cost of all materials, formwork, centering, scaffolding labour charges, HOM of machinery complete as per specifications. Specification No. KBS 0.5-1.2. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. - including coping on top of compound wall	cum	4
		Stone masonry		
4	PWD SR Vol.2,5.1.1, pg 9	Providing Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20 mm nominal size) upto plinth level with :Cement mortar 1:6 (1 cement : 6 coarse sand). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	3.5
		Steel		
5	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately) All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	216
		MS Work		
8		Gate - Providing and fixing of Gate (1.8 x 1.8m) made with Metal fabrication work using different sizes of MS Box sections, flats, round pipes, sheets, mesh etc,. Also, gate shall have swing mechanism which is manually operated. The work shall be complete including necessary hardwares, fittings and fixture.	Kgs	196

10	Vol. II/11.16.2, pg.81	Providing and fixing Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	797
		RCC		
6	PWD SR Vol.1, 2.4.3, pg 17 & apendix 1 for formwork sl.no-2, pg 115(6299+5%)=6613.95, AW=10%+6613.95=7275.25	Providing and laying in position Reinforced cement concrete (RCC) for all Sub structures of building, Compound wall columns , Irrigation works, Sub structure works of footing, upto below plinth beam , bridges, Drain works & other parallel works. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately). Also, necessary compacting / ramming of the earth to be considered for costing.Expansion joints / strip to be considered at regular intervals for the internal road. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges.	cum	3.5
		Brick work		
7	DOS - SOR-2017-18 B202 . pg 96	Providing and constructing BRICK MASONRY in cement mortar 1:6 (cement : coarse river sand) using well burnt WIRE CUT bricks with "RAT TRAP BOND" including raking out joints 10mm deep, to have exposed finish with sunk pointing, curing, shoring / scaffolding, etc., including toothing / bonding with cross walls of normal brick work (built with class 3.5 bricks minimum average compressive strength not less than 3.5N/sqmm) and provision of two nos., 10G (3.15mm dia) MS wire dowels 200mm long each at every 3rd course at junction of main wall and cross wall etc., complete all as per specifications and drawings and as per direction of engineer-in-charge. [NOTE: 1) Sunken pointing will be measured separately and paid elsewhere as in item. 2) Solid brick masonry around opening such as doors, windows, ventilators to be provided and the quoted rate should include the same and no extra will be permissible on account of this. 3) Rate is inclusive of cost of the MS wire dowels, toothing and bonding.] for superstructure up to floor five level including scaffolding, etc.	cum	1.5
		GI Fencing		
9	PWD SR Vol.2, 11.58, pg 95	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 50x50 mm including strengthening with 2 mm dia wire or nuts, bolts and washers as required complete as per the direction of Engineer-in-charge. (Made of G.I. wire of dia 4 mm). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	45
		Roofing		

11	Market survey	Roofing panel - Prefabricated Insulated Roofing Panels - PIR insulated sandwich panel 50mm thick of 0.4/0.35mm Galvalume sheet on both sides with Polyurethane Foam (puf) with PU foam spray density 35+/-5 kg/m ³ sloping roof as per profile. The rate shall include the flashing at necessary locations, roof ridge / apex panel, Gable ends, Gable trim, eave end trims, hardwares, etc., Including scaffolding. The quote shall include PVC profiled rain gutters of suitable shape & size with necessary supporting brackets. Downtake pipe - PVC Downtake pipe 100mm dia upto ground with necessary connecting joints etc., All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	45
12	PWD SR Vol.1, 2.1.1 pg 68	Aggregates filling - Providing and filling Stone Aggregate (Single size) : 20 mm nominal size at specified location. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	9
		Painting		
13	PWD SR 18-19, 15.015, pg 128	Providing and applying Premium Acrylic exterior paint of approved quality, colour and shade to wall surface after cleaning and rubbing the wall surface with wire brush of medium size emery stone to remove all the loosely adhering particles, the surface is then cleaned with water and ensured that it is in line and level. The textured material is then mixed with 40-50% of clean water until a homogeneous thick slurry is formed, the slurry is left for 5-10 min, to react completely with ingredients. The textured finish prepared as above is then applied to the wall surface with suitable roller/spraygun/putty/ blade/ trowel to get the desired finish. The finished surface shall be applied with two coats of exterior paint of approved shade. The rate includes providing and removing scaffolding, all lead and lift and all other incidental charges etc., Complete as per directions of the Engineer-in-charge of the work. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	sqm	58
14	PWD SR Vol.2,8.40, pg48	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (Metal/ Wood)	sqm	168

IISC_TEST FACILITY_CIVIL WORK

SI No.	Ref No.	Methodology/Description of Work	Unit	Qty
H		Internal driveway - 6.00 wide alaround		
1	PWD SR Vol.1 1.9, pg 07	Filling available excavated earth (excluding rock) in the Project Site wherever there is undulation of surface and levelling and preparing the ground for construction / road work. Since the site is a sloping ground an average fall of 5m is considered for taking up the filling work, in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering , lead up to 50 m and lift upto 1.5 m.All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	cum	95
		Steel		
2	PWD SR Vol.2,11.32, pg 84	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members wherever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately) All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	Kgs	5588
		MS Work		
3		Gate - Providing and fixing of MS main gate(5x1.8m), Pedestrian gate (1.2x1.8m), Removable drain covers of size 600 x 600mm (for underground water tank), Metal ladders(down to pump room & underground water tank) etc., made with Metal fabrication work using different sizes of MS Box sections, flats, round pipes, sheets etc., Also, gate shall have sliding mechanism which is manually operated. The work shall be complete including necessary hardwares, fittings and fixture.	Kgs	512
		RCC		
4	PWD SR Vol.1, 2.5.2, pg 17 & apendix 1 for formwork sl.no-2, pg 115(6299+5%)=6613.95, AW=10%+6613.95=7275.25	Providing and laying in position Reinforced cement concrete for all Super structures of building , Road works, RCC trenches, Water works, Irrigation works & super structure works of bridges upto 3.50 m height. The granite/ trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers laid in layers, well compacted using needle vibrators. The cost includes all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement, dowel bars & formwork to be paid separately). Also, necessary compacting / ramming of the earth to be considered for costing. Expansion joints / strip to be considered at regular intervals for the internal road. All works complete as per the drawing, technical specification and direction of the Engineer in-charge. Including cost of all materials, formwork, centering, scaffolding labour charges. M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates	cum	121.5
5	PWD SR Vol.2, 17.5, Pg no 151	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 750 x 450 x 75/ 150 mm, reinforced with 8 mm dia four nos longitudinal & 9 nos cross sectional T.M.T. hoop bars, including providing 50 mm dia perforations @ 100 to 125 mm c/c, including providing edge binding with M.S. flats of size 50 mm x 1.6 mm complete, all as per direction of Engineer-in-charge	no's	12

BOQ
PHE Works

Sl.No.		Description	Qty	Unit
PART A - EARTH WORK:				
1	PWD SR 2021-22 , Volume1,Refer Item 1.6.1, Page 6	Earth work excavation for pipelines/cables/ chambers gas pit etc by Manual/ mechanically means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour,lift and other incidental caharges, tools, usage& other appurtenances required to complete the work as per direction of engineeer incharge/ architect depth upto 1.5m.In all kinds of soils. Depth upto 1.50m	485.00	Cum.
2	PWD SR 2021-22 , Volume1,Refer Item 1.6.2, Page 7	Earth work excavation for pipelines/cables/ chambers gas pit etc by Manual/ mechanically means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour,lift and other incidental caharges, tools, usage& other appurtenances required to complete the work as per direction of engineeer incharge/ architect depth upto 1.5m to 3m .In all kinds of soils. Depth upto 1.50m	85	Cum.
3	PWD SR 2021-22 , volume1, Refer Item 1.10 Page 7	Refilling available earth around trenches/pipelines, cables in layers not exceeding 20 cms in depth, compacting each deposited layer by ramming after watering with a lead upto 50 m , and lift upto 1.5 m. Including cost of all labour complete as per specifications	570.00	Cum.
PART B - DRAINAGE (SOIL & WASTE) :				
4	PWD SR 2021-22 Refer Item 2.1.1 Page 15	Providing and laying in position plain cement concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings, cost of all materials of quality, labour, Usage charges of machineries, curing, and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork shall be paid separately)Mix 1:5:10 Using 40 mm and down size graded crushed coarse ag gregates for 110 mm dia pipes	2.25	cum

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Sl.No.		Description	Qty	Unit
5	CSR,WS&UGD SR 2021-22 T570A, Page 199	Providing and constructing of Machinehole chambers conical in shape at top with CC 1:3:6 foundation using 40mm and down size graded metal of approved quality and with an offset of 0.15m around the chamber and brick masonry in C.M 1:4 plaster with bricks of approved quality and CM plaster 1:3 proportion 12mm thick inside and outside except for the conical surface outside where the thickness of plaster shall be 20 mm thick, with 1 to 6 slope in the concrete towards the central drain, finished smooth and fixing of pipes in CC 1:2:4 with graded metal of 20 mm and down size including supplying and fixing SFRC Machinehole frame and cover conforming to IS 12592(Part-I): 1988 & IS 12592(Part-II) :1991 with latest amendments in CC 1:2:4, supplying and fixing of plastic foot steps staggered at 30cms apart as directed, watering, curing,barricading, danger lighting, pouring tar over M.H. frame and cover, cost of tar, shoring, strutting, dewatering, engraving Machinehole No. on the inner and outer conical surface etc. as per the drawing with all lead and lift,transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings for various diameters and depths noted below With Table Moulded Bricks & Heavy Duty SFRC Cover & Frame: For 1.2m dia,	1	No.
6	CSR, WS&UGD SR 2021-22 T130B,page 187	Constructing brick masonry chamber of internal dimension 600x600mm and depth of 600mm (inner dimensions) with modular bricks of CD 75 in cement mortar 1:6, bed concrete 150mm thick with 1:3:6, plastering 12 mm thick with cement mortar 1:4, CC 1:2:4 coping 75mm thk for fixing CI cover & frame etc. including the cost of CI frame and cover of medium duty , including transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings	8	No.
7	CSR, WS&UGD SR 2021-22 T130C,page 187	Constructing brick masonry chamber of internal dimension 610x450mm and depth of 600mm (inner dimensions) with modular bricks of CD 75 in cement mortar 1:6, bed concrete 150mm thick with 1:3:6, plastering 12 mm thick with cement mortar 1:4, CC 1:2:4 coping 75mm thk for fixing CI cover & frame etc. including the cost of CI frame and cover of medium duty, transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings	6	No.
8	CSR, WS&UGD SR 2021-22 T130D,page 187	Constructing brick masonry chamber of internal dimension 450x450mm and depth of 600mm (inner dimensions) with modular bricks of CD 75 in cement mortar 1:6, bed concrete 150mm thick with 1:3:6, plastering 12 mm thick with cement mortar 1:4, CC 1:2:4 coping 75mm thk for fixing CI cover & frame etc. including the cost of CI frame and cover as per medium duty, transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings	2	No.

Sl.No.		Description	Qty	Unit
9	CSR, WS&UGD SR 2021-22 page 134	Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. PVC pipes 75mm dia., 6 kg/sqcm & class 3 Ground floor. code -M010E	14	M
10		Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. PVC pipes 90mm dia., 6 kg/sqcm & class 3 Ground floor. code -M010E	10	M
11		Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge PVC pipes 110mm dia., 6 kg/sqcm & class 3 Ground floor. code -M010G	12	M
12		Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing transportation and other incidental charges etc, as per directions of engineer incharge/ architectural drawings the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. PVC pipes 160mm dia., 6 kg/sqcm & class 3 Ground floor. code -M010I	10	M

Sl.No.		Description	Qty	Unit
13	Rate analysis Item	Supplying S&S RCC SPUN / VIBRATED CAST PIPES (REINFORCED) pipes NP-3 Class conforming to IS:458-1988 with latest amendments using ordinary portland cement, for sanitary works and conveying to work site, rolling and lowering into trenches, laying true to line and level including loading and unloading at both destinations and jointing of pipes and specials, perfect linking of joints with jack to correct position including cost of jointing materials, i.e, rubber rings conforming to IS: 5382 for S&S RCC pipes, with all leads and lifts as directed and giving necessary hydraulic test as per ISS to the required pressure and commissioning etc. complete. (Contractor will make his own arrangements for procuring water for testing). Before the execution of the work, the contractor shall carry out the survey. RCC NP3 Class pipe of 300 mm dia. Code T050B	30	M
14	Market Rate	Rainwater Harvesting (Dia. of well 1.5m and Depth 6.0m) - Providing, constructing 6.0m deep percolation pit comprising of 1.5m dia pre-cast RCC rings, 300mm thick side filling around outside of RCC rings (annular space) with 40mm size boulders including filling of percolation pit upto 1.5m depth (from bottom up) with 25-75mm clean washed gravels followed by 1.5m depth of 10-25mm of clean washed stones including covering with RCC slab, manhole frame & cover, PVC rungs etc. including arrangement for inlet & outlet pipe, excavation & backfilling as shown in the drawing. The rate shall be inclusive of all labour, material, wastage, scaffolding, transportation, taxes, including all leads, lifts at all levels. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	4	No.
		PUBLIC HEALTH ENGINEERING WORKS - PART C - SANITARY FIXTURES		
15	Market Rate	Providing and fixing water closet with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required. White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge		No.
16	Rate analysis Item	Providing and fixing white vitreous china wall mounted type water closet (European type) with seat and lid, 10 litre low level white vitreous china flushing cistern & C.P. flush bend with fittings & C.I. brackets, 40 mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required. W.C. pan with ISI marked white solid plastic seat and lid. JaquarACS-WHT-87953IUFSM with concealed cistern Ground floor ladies and gents' toilet. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2.00	No.

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Sl.No.		Description	Qty	Unit
17	Rate analysis Item	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350 mm with white PVC automatic flushing cistern, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass, including painting of fittings and cutting and making good the walls and floors wherever required :Single half stall urinal with 5 litre P.V.C. automatic flushing cistern. Jaquar URS-WHT-13253N , Ground floor Gents' Toilet. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	1.00	No.
18	Rate analysis Item	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require:White Vitreous China Wash basin size 550x400 mm with a pair of 15 mm C.P. brass pillar taps. SLS-WHT-6601 with CP Queens collection pillart ap. Ground floor Ladies & Gents' toilet. All material should be of approved make. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2.00	No.
19	Rate analysis Item	Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet :100 mm diameter victorian shower OHS-CHR-1843 & Single lever diverter FUS CHR-29139 and spout	2	No.
		All works complete as per the drawing, technical specification and direction of the Engineer in-charge		
20	Rate analysis Item	Providing and fixing in position , CP Health faucet, Hand Shower (Health Faucet) with 8mm Dia, 1.2 Meter Long Flexible Tube & Wall Hook,Two way bib cock (81041). Ground floor ladies and Gents; toilet	2.00	No.
21	PWD SR 2021-22, VOLUME2, Chapter 14, Item 14.31 page 128)	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete. Ground floor'. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2.00	No.
22	PWD SR 2021-22, VOLUME2, Chapter 14, Item 14.31 page 129)	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete. Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	400	No.
23	PWD SR 2021-22, VOLUME2, Chapter 14, Item 14.40.2 page 130)	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour 600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm, weighing not less than 190 g. Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	50	No.
24	PWD SR 2021-22, VOLUME2, Chapter 13, Item 13.3.1 page 115)	Providing and fixing brass stop cock of approved quality :15 mm nominal bore . Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No.

FCI

Sl.No.		Description	Qty	Unit
25	Rate analysis Item	Providing and fixing in position SS Toilet paper holder 150 x 150 including necessary screws, wooden cleats etc. complete (Market Rate) FLR-1151 N,Ground floor (European Water closet). All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No.
26	Rate analysis Item	Providing and fixing in position White vitreous SS soap Dish including cement jointing etc. complete (Market Rate) FLR-1131N, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No.
27	Rate analysis Item	Providing and fixing in position SS Towel ring including necessary screws, wooden cleats etc. complete (Market Rate)ACN-1121BN, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No
28	Rate analysis Item	Providing and fixing in position CP brass 20 mm dia Concealed stop cock with wall flange Towel ring including necessary fittings etc. complete (Market Rate)Jaquar Regular Concealed Stop Cock 20MM-089 ALD-CHR-089, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No.
29	Volume 2, Item 13.41, SR 2021-22)	Providing and fixing sand cast iron trap of 100 mm dia of self cleansing design with screwed down or hinged grating with or without vent arm including cutting and making good the walls and floors, cost of materials, labour, testing, complete as per specifications (Ground floor). All works complete as per the drawing, technical specification and direction of the Engineer in-charge	7	No.
30	(Page 89, Item 12.99, SR 2018-19)	Providing and fixing M.S stays and clamps for sand cast iron pipes of 100mm dia including cost of materials, labour, complete as per specifications. Ground floor & first floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	6	
31	(Page 89, Item 12.100, SR 2018-19)	Providing and fixing M.S stays and clamps for sand cast iron pipes of 75mm dia including cost of materials, labour, complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	6	No.
32	(Page 89, Item 12.101, SR 2018-19)	Providing and fixing M.S stays and clamps for sand cast iron pipes of 50mm dia including cost of materials, labour, complete as per specifications. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	8	No.
33	Volume 2, Item 13.39, SR 2021-22)	Providing and fixing Square mouth gully trap SP-1 complete. With CI grating brick masnory chamwith non modular burnt clay ricks of designation 3.5 & with water tight C.I cover and frame of 300x300mm size (Inside) the weight of cover to be not less than 4.5 kgand frame not to be less than 2.7 kg as per standard design. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	2	No.

Sl.No.		Description	Qty	Unit
34	CSR, WS&UGD SR 2021-22 page 139, M150i	Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. 6KG/SQCM , PVC pipes 75mm dia., 6 kg/sqcm & class 3, Ground floor (Waste line from floor traps & vent pipe) Code -M-1501. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	15.00	M
35	CSR, WS&UGD SR 2021-22 page 139, M150j	Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. 6KG/SQCM , PVC pipes 90mm dia., 6 kg/sqcm & class 3, code -M-150J, First floor (Waste line from floor traps & vent pipes) Ground floor Urinals.All works complete as per the drawing, technical specification and direction of the Engineer in-charge	8.00	M
36	CSR, WS&UGD SR 2021-22 page 139, M150k	Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. 6KG/SQCM , PVC pipes 110mm dia., 6 kg/sqcm & class 3, code -M-150K, First floor (Waste line from floor traps & vent pipes) Ground floor Urinals and water closets. All works complete as per the drawing, technical specification and direction of the Engineer in-charge	12.00	M
37	CSR, WS&UGD SR 2021-22 page 139, M150m	Providing and installing at site of work P.V.C. pipes including cost of pipes and specials and labour, including lowering into trenches, laying true to line, level and perfect linking at joints leak proof including jointing of approved type with all labour charges and all lift charges, handling charges including encasing the pipe around to a depth not less than 15 cms with gravel or selected earth available from the excavation etc. complete. 6KG/SQCM , PVC pipes 160mm dia., 6 kg/sqcm & class 3, code -M-150M, First floor (Waste line from floor traps & vent pipes). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	18.00	M
		PART D - WATER SUPPLY		
38	Market Rate	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 15 mm dia, ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	

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Sl.No.		Description	Qty	Unit
39	(Page 94, Item 13.42, SR 2018-19)	Providing and fixing in position brass ball valve high or low pressure with plastic float of approved quality 25mm nominal bore including cost of all materials, labour and HOM with all leads complete as per specifications , Ground floor, All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No
40	(Page 94, Item 13.45, SR 2018-19)	Providing and fixing in position 25mm nominal bore brass ferrule with C.I mouth cover including boring and tapping the main, cost of all materials, labour and HOM with all leads complete as per specifications. Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No.
41	Page 94, Item 13.48, SR 2018-19)	Providing and fixing unplasticised PVC connection pipe with brass union 20mm nominal bore 600 mm length of PVC connection including cost of all materials, labour and HOM with all leads complete as per specifications (Ground floor). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	4	Set
42	PWD SR 2021-22 Refer Item 13.6.4.1 Page 116	Providing and fixing gun metal non- return valve of approved quality (screwed end) :50 mm nominal bore Horizontal. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No.
43.0	PWD SR 2021-22 Refer Item 13.6.4.1 Page 116	Providing and fixing gun metal non- return valve of approved quality (screwed end) :80 mm nominal bore Horizontal. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No.
44		Providing and placing on terrace, polyethylene water storage tanks as per IS 12701-1996 with manhole lid and suitable locking arrangements, making holes of suitable diameter for inlet, outlet and over flow pipes, including cost of all materials, labour, transport charges, HOM and testing complete as per specifications (For 1000 litre capacity) on terrace. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2000	Ltr
45	CSR 2021-22,Item 16(Code N-180-N180H,Page 136)	Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 25 mm dia GM (Copper alloy) Gate valves,codeN180C, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No
46		Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 32 mm dia GM (Copper alloy) Gate valves,codeN180D, Ground floor	2	No

Sl.No.		Description	Qty	Unit
47		Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 40 mm dia GM (Copper alloy) Gate valves,codeN180E, Terrace. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No
48		Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 50 mm dia GM (Copper alloy) Gate valves,codeN180F, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No
49		Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 65 mm dia GM (Copper alloy) Gate valves,codeN180G, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	1	No
50		Supply and delivery at site GM (copper alloy) gate valves confirming to Class-I as per IS 778 with latest amendments, 1 No. screwed in bonnet inside screw, rising spring spindle integral seat screwed females ends confirming to IS 554/ 1990 body hydraulically tested 1.5HP seat standard tested 1 HP with IS mark,For 80 mm dia GM (Copper alloy) Gate valves,codeN180H, Ground floor. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	1.00	No
51	CSR 2021-22,Item 63, PAGE 81	Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778, having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00 mtr spacing. This includes jointing of pipes and fittings with one step CPVC solvent cement & the cost of cutting chases & making good the same including testing of joints complete. (Concealed work including cutting chases and good the walls etc.) - 25mm nominal OD pipes .Ground floor(Intenal & duct Piping). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	30.00	M

FCI

Sl.No.		Description	Qty	Unit
52		Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes jointing of pipes and fittings with one step solvent cement, trenching, refilling & testing of joints complete. (external work). - 32mm nominal OD pipes .Ground floor(Duct Piping) &First floor (Duct piping). All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	75.00	M
53		Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes jointing of pipes and fittings with one step solvent cement, trenching, refilling & testing of joints complete. (external work). - 40mm nominal OD pipes . Terrace piping. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	30.00	
54		Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes jointing of pipes and fittings with one step solvent cement, trenching, refilling & testing of joints complete. (external work). - 50mm nominal OD pipes . Ground floor Campus supply line. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	150.00	M
55		Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes jointing of pipes and fittings with one step solvent cement, trenching, refilling & testing of joints complete. (external work). - 65.0mm nominal OD pipes . All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	50.00	m
56		Providing and fixing Chlorinated Poly Vinyl Chloride (CPVC) pipes conforming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes jointing of pipes and fittings with one step solvent cement, trenching, refilling & testing of joints complete. (external work). - 80mm nominal OD pipes . All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	400.00	m
57	CSR 2021-22,Item 46(Code P440C),Page 164	Supply and delivery of Centrifugal pumpset at site brand new best make and with discharge duty conforming to ISI standards and its latest amendments.3 HP, size 50x40 Head 30M, Discharge 198 LPM. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No

FCI

Sl.No.		Description	Qty	Unit
58	CSR 2021-22,Item 46(Code P270A),Page 162	Supply, installing,testing and commissioning COMMON control panel consisting of the following INCOMING:1 No set of Phase indicating lamps with SFU of suitable rating 1 No, Analog Ammeter, 1 No Analog Voltmeter 1ni with Phase selector switch, Isolating switch OUTGOING for Main Electrical Pump: 1 No. MCB 1 No. DOL of S/D Starter suitable for respective HP 1 No. Electrcl Protection Like single Phase preventor, under voltage over Volage, under current over current & dry run protection suitable for the pump described above 1 no Indoor type.Upto 6 HP pumps. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No
59	Market Rate	Providing, Installing testing and commissioning of Water level controller with following features, Input voltage 220V AC/50 Hz Voltage Variation +/- 20%, Dry Run Condition 60 Sec Delay after return to normal line voltage and power on. 45 Sec after Dry Run ,Sump and lank levels indication on the facia. Hi/Low/Normal Voltage indication, Flow indication, Pump Motor On/Off /Trip. Push-button to override controls and switches on the Pump motor till the tank fills up. Pump Motor switched on automatically when level falls below set low. Auto / Manual Switch for manual operation of pump motor. Audio Alarm on Dry Run. Push-button to silence the Alarm One N/O Contact for DOL Two N/O, N/C Contacts for Starters etc., complete. All works complete as per the drawing, technical specification and direction of the Engineer in-charge.	2	No

BOQ
Fire Protection

Sl.No.	SR no.	Description	Qty	Unit
A		PART A - EARTH WORK:		
1	PWD R 2018-19 , Volume1,Refer Item 1.6.1, Page 6	Earth work excavation for pipelines/cables by Manual means upto 600 mm trench width, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, including dressing of excavated surfaces, disposing off or leveling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m. Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering and lift upto 1.5 m including cost of labour, tools, usage& other appurtenances required to complete the work.In all kinds of soils. Depth upto 1.50m	-	
	a	Fire Line	90.0	Cum.
2	PWD R 2018-19 , Volume1,Refer Item 1.6.2, Page 7	Extra for excavating trenches for pipes, cables and similar works in all kinds of soil where excavation width is upto 600 mm for depth exceeding 1.5 m, but not exceeding 3 m. add 20 % extra (Rate is over corresponding basic item for depth upto 1.5 m)	30.0	Cum.
3	PWD R 2018-19 , volume1, Refer Item 1.10 Page 7	Refilling available earth around trenches/pipelines, cables in layers not exceeding 20 cms in depth, compacting each deposited layer by ramming after watering with a lead upto 50 m , and lift upto 1.5 m. Including cost of all labour complete as per specifications	130.0	Cum.
		FIRE PROTECTION WORKS - PART B - FIRE HYDRANT SYSTEM - WET RISER SYSTEM		
4	CSR 2021-22 , VOL5 ,page 90	Manufacturing, providing, trasporting, rolling, lowering, laying, jointing and commissioning of ERW (Electric Resistance Welded)/ SAW (Submerged Arc Welded) MS pipes of Outer dia (Fe-410 grade) conforming to IS 3589-2001 with latest amendments, including perfect linking and welding of joints to correct position, cost of the pipes, conveyance, lead, lift charges, cost of all labour and giving satisfactory hydraulic test as per IS 3589-2001 with latest amendments for test pressure and working pressure both at factory and site etc. complete as per detailed specifications inside with CM 1:1.5 lining of minimum 10mm thick for pipes upto 610mm OD and with minimum 12mm thick beyond 610mm OD and out side with minimum 25mm thick coating in CM 1:3 over 50 x 50mm weld mesh of 13 gauge, including loading and unloading of pipes for the following diameters and specified thickness of plate as noted below, including bailing out of water wherever necessary. (Contractor will make his own arrangements for procuring water for testing)250 mm dia , 273.1 mm-6mm thick CSR- 2021-22,Page 90, F020C, pump room	6.0	M

Sl.No.	SR no.	Description	Qty	Unit
5		Manufacturing, providing, trasporting, rolling, lowering, laying, jointing and commissioning of ERW (Electric Resistance Welded)/ SAW (Submerged Arc Welded) MS pipes of Outer dia (Fe-410 grade) conforming to IS 3589-2001 with latest amendments, including perfect linking and welding of joints to correct position, cost of the pipes, conveyance, lead, lift charges, cost of all labour and giving satisfactory hydraulic test as per IS 3589-2001 with latest amendments for test pressure and working pressure both at factory and site etc. complete as per detailed specifications inside with CM 1:1.5 lining of minimum 10mm thick for pipes upto 610mm OD and with minimum 12mm thick beyond 610mm OD and out side with minimum 25mm thick coating in CM 1:3 over 50 x 50mm weld mesh of 13 gauge, including loading and unloading of pipes for the following diameters and specified thickness of plate as noted below, including bailing out of water wherever necessary. (Contractor will make his own arrangements for procuring water for testing)250 mm dia , 273.1 mm-6mm thick CSR- 2021-22,Page 90, F020C, pump room	6.0	M
6		Supply, Installation testing and commissioning of approved make heavy quantity (Class 'C') confirming to as per IS1239 Such as Tees elbows check nuts unions, Flanger, Nipples etc. including cutting welding, Trending fixing on walls, cealing (Using 41-Tech pipe/M.S.angle supports work includes two coats of metal primer and two coats of Red enamel paint etc. 200 mm dia, pump room	6.0	M
7		Supply, Installation testing and commissioning of approved make heavy quantity (Class 'C') confirming to as per IS1239 Such as Tees elbows check nuts unions, Flanger, Nipples etc. including cutting welding, Trending fixing on walls, cealing (Using 41-Tech pipe/M.S.angle supports work includes two coats of metal primer and two coats of Red enamel paint etc. 150 mm dia, Ring main	6.0	M
8		Supply, Installation testing and commissioning of approved make heavy quantity (Class 'C') confirming to as per IS1239 Such as Tees elbows check nuts unions, Flanger, Nipples etc. including cutting welding, Trending fixing on walls, cealing (Using 41-Tech pipe/M.S.angle supports work includes two coats of metal primer and two coats of Red enamel paint etc. 100 mm dia, Branch outs	150.0	M
9	CSR- 2021-22,Page 74, Item 31-Code B079	Supplying and fixing Wafer type single flange Butterfly valve conforming to relevant IS 13099/9991 EN GGG40/50 with latest amendments as detailed below of the following diameter and types with TP set and conveying to work site, loading and unloading, stacking etc. with all lead and lift. The rate is inclusive of the cost of valve, TP set, bolts and nuts and excluding earth work.PN 1.6 250 mm dia pump room	2.0	No.
10	B0790	PN 1.6 200 mm dia	4.0	No.
11	B079N	PN 1.6 150 mm dia	4.0	No.
12	B079M	c) PN 1.6 100 mm dia	2.0	No.
13	(Market rate)	Providing & constrcutng valve chambers for above valves in 230 mm thick BBM in CM 1:6 on PCC bed of :3:6 150 mm thick, fixing in position ground level, isolation boxes for following dia valves. Including SFRC heavy duty cover and frame etc. complete - a) 150 mm dia. 900x900x900 mm	2.0	No.
14		100 mm dia. 750x750x900 mm	2.0	No.

Sl.No.	SR no.	Description	Qty	Unit
15	(PWD SR 2021-22,Part III Item 15.92 Page 17(20))	.Supplying Installing, testing and commissioning of 63mm dia single headed Gun mental Hydrant Valve with flanged inlet, stop valve, spindle and cast iron hand wheel. It has a female instantaneous outlet with Blank Cap and is Hydrostatically tested to 21 Kgf/cm2 pressure having a flow rate of 900 LPM at 7 Kgf/cm 2 of pressure with blank cap and wheel as per IS 5290 etc. complete including cost of materials, labour, usage charges of machinery complete as per specifications.	4.0	No.
16	(PWD SR 2021-22,Part III Item 15.93 Page 17(20))	Supplying Installing, testing and commissioning of 63mm mm dia double headed Gun mental Hydrant Valve with flanged inlet 2Nos, stop valve, spindle and cast iron hand wheel. It has a 2 Nos female instantaneous outlet with blank cap and is hydrostatically tested to 21 kgf/cm2 pres sure having a flow rate of 900 LPM at 7 kgf/cm2 of pressure confirms to IS : 2190 with blank cap and wheel as per IS 5290 etc. including cost of materials, labour, usage charges of machinery complete as per specifications. complete	4.0	No.
17	(PWD SR 2021-22,Part III Item 15.96 Page 17(20))	.Supplying Installing, testing and commissioning of Reinforced Rubber Lined RRL Fire hose of 63mm dia 15m length as per IS 8423 binded with one set of male and Female Instantainious Gun metal coupling as per IS 903 complete including cost of materials, labour, usage charges of machinery complete as per specifications.	12.0	No.
18	(PWD SR 2021-22,Part III Item 15.95 Page 17(20))	Supplying Installing, testing and commissioning of Gun metal Branch pipe size of 63mm dia x19mm dia as per IS 903 complete including cost of materials, labour, usage charges of machinery complete as per specifications.	12.0	No.
19	(PWD SR 2021-22,Part III Item 15.97 Page 17(20))	Supplying Installing, testing and commissioning of Hose cabinet made out of 18 gauge M.S.sheet with double glass door with lacing arrangement and painted with two coats of Fire red Enamel paint at outer ise of the Box and two coats of white enamel paint at inner side of the box is to accomodated 2 Nos. of Fire hose box size 20"x24"x10" complete including cost of materials, labour, usage charges of machinery complete as per specifications.	8.0	No.
20	(PWD SR 2021-22, Part III, Item 15.100,Page 18(20))	Supplying Installing, testing and commissioning of 19mm dia 36.50m length hose with rubber lining smooth bore, reinforced of natural/synthetic fibres, a rubber cover finish shall be smooth, fluted or fabric marked with minimum thickness of 1.50mm and to with stand a working pressure of 10Kgf/sqcm confirms & tested as per IS 444/ IS 12585 including cost of materials, labour, usage charges of machinery complete as per specifications.	4.0	No.
21	(PWD SR 2021-22, Part III, Item 15.84, Page 16(20))	Supplying Installing testing and commissioning approved make Centrifugal pump end suction type couple to Electric mortar of suitable HP, fitted on a common base frame and rated for Fire duty. Including 2 nos. Pressure guages fitted on suction & delivery side of the pump. The pums shall run on 400/440V, 3ph, 50Hz electric supply, Duty of pumps: 2850 Lpm@ 70.0m Head. Control panel shall be per specification stated in Item No.87. including cost of materials, labour, usage charges of machinery complete as per specifications. (Cost of control pannel is not included)	2.0	No.

Sl.No.	SR no.	Description	Qty	Unit
22	(PWD SR 2021-22, Part III, Item 15.85, Page 16(20))	Supplying, Installing, testing and commissioning of fire hydrant multi stage pump capable of delivering 2850Lpm @ 70.0m head coupled to water cooled diesel engine of adequate HP. It shall be fitted with a radiator on a common base from with complete ancillary units such as coiling system, non return Valve, Y strainer, fuel tank of adequate capacity, Pressure gauge, pressure switch. Control panel shall be per specification stated in Item No.87. including cost of materials, labour, usage charges of machinery complete as per specifications. (Cost of control panel is not included)	1.0	No.
23	(PWD SR 2021-22, Part III, Item 15.86, Page 16(20))	Supplying, Installing, testing and commissioning electrically driven jockey pump of capacity 180.0 Lpm at 70.0m head with all the necessary accessories viz. Pressure gauges etc. operating on 3Ph 50Hz, 400/440 V AC supply including foundation, bolts etc. complete Control panel shall be per specification stated in Item No.87. including cost of materials, labour, usage charges of machinery complete as per specifications. (Cost of control panel is not included)	2.0	No.
24	(PWD SR 2021-22, Part III, Item 15.80 Page 15(20))	Supplying Installing testing and commissioning electrically driven Terrace pump of capacity 900.0 Lpm at 35.0m Head with all the necessary accessories viz. Pressure gauges etc. operating on 3Ph 50Hz,	2.0	No.
25		Supply and laying of following sizes of Armoured Aluminium Cables for electrical motor, control panel, pressure switch, jockey motor etc.. The rate inclusive of all incidental charges, necessary scaffolding and redoing the dismantled portions to its original condition wherever found necessary, etc., complete as per standard specification and as directed by the Departmental Officers. Make: POLYCAB / PARACON / FINOLEX / EQUIVALENT 3 core 95 sq.mm. armoured aluminium cable	50.0	RM
26		4 core 16 sq.mm. armoured aluminium cable	50.0	RM
27	DSR-2018, Item 5.6, page 26	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required	6.0	No.
28	CSR 2021-22, page 72, Item 28.1, B076A)	Supply and fixing of Cast steel ASTM A 216 Gr.WCB double flanged Dual plate check valve Conforming to API 594 with latest amendments Shaft material shall be SS420/431 and spring shall be spring steel superior grade quality as detailed below of following diameters and types and conveying to work site, loading, unloading, stacking with appurtenances., complete with all lead and lift. The rates are inclusive of cost of Galvanised Bolts and Nuts: For Class 300, 80 MM DIA	2.0	No.
29	(PWD SR 2021-22, Part III, Item 15.94 Page 17(20))	Supplying Installing, testing and commissioning of Gun metal AIR RELEASE VALVE SIZE OF 25mm dia including cost of materials, labour, usage charges of machinery complete as per specifications. complete	4.0	No.
30	Market Rate)	Providing and fixing in position 'Y' type stariners of 200 mm dia including necessary fittings and specials etc., complete	3.0	No.
31	Market Rate)	Providing and fixing in position 'Y' type stariners of 150 mm dia including necessary fittings and specials etc., complete	2.0	No.

Sl.No.	SR no.	Description	Qty	Unit
32	(PWD SR 2021-22, Part III, Item 15.105, Page 18(20))	Wrapping and Galing of U/G pipe line work includes one coat of anti corrosion paint (Black) and two coats of Bituminous cloth. including cost of materials, labour, usage charges of machinery complete as per specifications. 200 mm dia	25.0	M
33		150 mm doa	125.0	M
34		100 mm dia	50.0	M
35	Market Rate)	Providing ,fixing and testing pressure switch as per specifications.including necessary accessories etc., complete (Market Rate)	10.0	No.
36	(PWD SR 2021-22, Part III ,Item 15.79 Page 16(20))	Supply installing, testing and commissioning COMMON control panel for fire fighting system consisting of electrical mortar driven 60 HP Main fire pump, Jockey pump and 12.5 HP consisting of the following INCOMING: 1 No. Set of phase indicating lamps with SFU Rate 350A 1 No. set of 400 Amps. TPNE Ai. Bus bars 1 No. 0-400 Amps. Ammeter, 1 No.0-600V voltmeter with phase selector switch, Isolating Switch 400 A OUTGOING for Main Electrical Pump: 1 No. 200 Amps MCB 1 No.S/D starter suitable for 60 HP 1 No. Singel phse preventor suitable for the pump described above 1 No. set of ON/OFF indicating lamps 1 No. Automanual selector switch OUTGOING for Jockey Pump: 1 No. 50 Amps MCB 1 No. DOL starter suitable for 12.50 HP 1 No. Single phase preventor suitable for the pump described above 1 No. set of ON/OFF indicating lamps 1 No. Automanual selector switch ENGINE CONTROL SECTION NO.1 Diesel Engine for Standby pump: a) Main switch 2 pole ON/OFF -1 No. b) Batter charger with transpormer with rectifier reistance DC ammeter, DC voltmeter, T/B selector swith -1 set c) Indicating lamps for fault communication (Battery charger, supply ON, Control ON, engine running, low oil pressure, high water pressure and enginer overspeed) - 6 Nos. Push buttons for starter, stop reset- 4 Nos. e) Selector switches (Engine control, mode selctor) - 2 Nos. f) Auxilary rellays/contractors/timer for dsequience operating for starting and stopping of the engine -1 g) Hooter for audio alarm (Industrial type) -1 No. Accessoreis for outgoing supply for the morttors GI SWD earthing wire for the aove motor Accessories for outgoing supply for Diesel Enginer: Copper conductor armoured cabc 2.5 sqmm of 12 Core x 2 runs a) Battery 2 strands b) Enginer ON/OFF 2 strands c) Low oil pressure 3 strands d) Enginer oversped 2 strands e) Water temperature 2 strands f) Spare 1 strand The cost of control panel shall also include necessary pressure swithces with necessary cabling & inter-locked with the panel to enable sequential operation of Pumps. Including terrace mortar necessary earthing All the components shall be housed in a common cubical. However, the feed cable for diesel engine driven pump battery charger shall be taken separately including cost of materials, labour, usage charges of machinery complete as per specifications..	1.0	Set
37	Market Rate)	Providing & fixing in position Municipal fire tender Connection (MFTC) or Fire brigade Inlet (FBI) connection consisting of following arrangement a) 2 no' 63 mm dia. instantaneous inlet arrangement on a 150 mm dia. header (Market Rate).	2.0	No.
PART C- FIRE EXTINGUISHING SYSTEM (PORTABLE-CHEMICAL BASED) :				

Sl.No.	SR no.	Description	Qty	Unit
38	(PWD SR 2021-22, Part III, Item 15.30 Page 7(20))	Providing 2 Kg CO2 Gas Type Fire Extinguisher Squeeze grip type, used Unused Mechanism, Squeeze Grip, Gross Weight 9.1 Kg. empty Weight 7.1 Kg. Can Height 595MM Diameter 108MM, Discharge Time less than 8 Sees, Controllable discharge mechanism, Applicable on Class 8&C Fire, 8 Rating 88, Can Construction : Hot spinning/Forging, Valve Construction : Forging & Machining, Internal Coating of Can : Not Applicable, External coating of Can : Spray Painting, Sheet metal thickness: 4.0MM ISI Approved, 1 Year Warranty.with instalert system with Superior quality EPDM Rubber Hosepipe etc., including cost of materials, labour, usage charges of machinery complete as per specifications. complete	8.0	No.
39	(PWD SR 2021-22, Part III, Item 15.31 Page 7(20))	Providing 4.5Kg CO2 Gas Type aluminium body Squeeze grip Fire Extinguisher, Trolley Mounted, Easy Weight Management, Used Unused Mechanism, Squeeze Grip, Gross Weight 11.16Kg. empty Weight 6.66Kg. Can Height 860MM Diameter 140MM, Discharge Time less than10 Sees, Controllable discharge mechanism, Applicable on Class 8&C Fire, 8 Rating 138, Can Constuction : Cold Impact Extrusion, Valve Construction : Forging & Machining, Internal Coating of Can : Not Applicable, External coating of Can : Spray Painting, Aluminium metal ISO & PESO Approved, 3 Year Warranty. including cost of materials, labour, usage charges of machinery complete as per specifications. complete.	6.0	No.
40	(PWD SR 2021-22, Part III, Item 15.8 Page 7(20))	Providing 6kg Fire Extinguisher Mono Ammonium Phosphate Powder 90, Stored Pressure Type, Pressure Gauge, Gross Weight 9.40 Kg, empty weight 3.4 Kg, Can Height 480MM, Diameter 160MM, Discharge Time less than 13 Sees, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, applicable on Class A,B, C and electrically started Fire, A Rating 3A, B Rating 21B, Can construction : Deep drawn & Co., Mig welded, valve Construciton : Forging and Mechining, Internal Coating of Can: Epoxy powder coating, External Coating of Can: Epoxy Polyster power coating, Sheet metal thickness: 1.60MM, 5 years Warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., including cost of materials, labour, usage charges of machinery complete as per specifications. complete IS 15683 and CE Approved	8.0	No.
41	(PWD SR 2021-22, part III, Item 15.46 Page 9(20))	Providing 9 Kg Fire Extinguisher Mono Ammonium Phosphate Powder 90, Stored Pressure Type, Pressure Gauge, Gross Weight 9.40 Kg, empty weight 3.4 Kg, Can Height 480MM, Diameter 160MM, Discharge Time less than 13 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, applicable on Class A,B,C and electrically started Fire, A Rating 3A, B Rating 21B, Can construction : Deep drawn & Co., Mig welded, valve Construction : Forging and Machining, Internal Coating of Can : Epoxy powder coating, External Coating of Can : Epoxy Polyster power coating, Sheet metal thickness : 1.60MM, Helium Leak Detection Tested, ISI and EN Approved, 5 years Warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc. complete (4.0	No.

Sl.No.	SR no.	Description	Qty	Unit
42	(Page 358, Item No 40.49, SR 2018-19)	Green mist Extinguishers : Providing 6 Ltr Watermist technology base, Stored pressure type, Rating -8A. 34B & 40F, Mild steel body t, Tamper- proof safety seal, Effective on Class-A, Class-B, Class-F and Electrically Started Fires, Built-in pressure gauge, Instalert, Uses distilled water, Gross Weight 12.15 Kg, empty Weight 6.15kg, can Height 615mm Diameter 175M M, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Can Construction: Deep drawn & CO2 Mig welded, Valve Construction: Forgin & Machining, ERDA approved, Sheet metal thickness : 2.00MM, Discharge Time : Min. 64 Sec., 5 Year Warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., including cost of materials, labour, usage charges of machinery complete as per specifications. complete	4.0	No.
PART D - FIRE ALARM SYSTEM				
65	(PWD SR 2021-22, Part III, Item 15.55, Page 12(20))	Analogue Addressable 1 to 4 loop Fire Alarm Control Panel expandable via plug-in loop driver boards, loop current 500mA maximum per loop, dual flash based microprocessor, supports to connect 240 addressable devices one each loop via fully digital communication protocol, equipped with a white backlit display (240x64 pixel resolution) graphical LCD Display with at least 6 lines of information, 400 fire zones (soft zones), fully programmable via alphanumeric keypad or configuration software, dedicated USB and RS-232 serial port for direct or PC connection. 10500 events storage, loop current 500 mA, panel shall be equipped with in-built multi-meter for live monitoring of loop current, earth voltage, loop voltage etc., installer's logo application, network card to network with compatible addressable panel(s) and repeater panel(s), capable to connect maximum 200 network nodes on a standard network, features battery charger status and temperature, supports programmable cause / effect on outputs, panel housing meets IP30 ingress protection classification finished in RAL 7035, Independently certified as. Make- ARGUS complying with requirements of BS EN 54 Part 2, 4, and 13. Approved by: LPCB/VDS	1.0	No.
66	Market Rate	Extra Loop Cost for addition / deletion of extra Loop cards in to the panel mentioned above.	-	No.
67		Software Supply and installation of software for programming(mapping) the Fire detection and voice alarm system through FACP / Lap top. The software shall consist with facility like Upload / down load of information's to FACP, Graphics compatible to auto cad, Detectors information with change in address / sensitivity etc as required.	1.0	No.
68	(PWD SR 2021-22, Part III, Item 15.66, Page 14(20))	SMOKE DETECTOR Supply, install, test and commissioning of analogue addressable Smoke Sensor detector and standard base (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: VDS/UL/EN54. Make: Advanced (UK),Argus (UK) Simplex, Notifier, EST	2.0	No.
69		SMOKE DETECTORS- with explosion proof enclosure -Providng, Installing, testing and commisioning of Analogue Addressable with explosion proof enclosure, Photoelectric type smoke detectors, programmable for timed automatic sensitivity selection with base, Junction box and other accessories as required and detectors shall be UL listed,	2.0	M

Sl.No.	SR no.	Description	Qty	Unit
70	(PWD SR 2021-22, Part III, Item 15.68, Page 14(20))	HEAT DETECTORS Supply, install, test and commissioning of analogue addressable dual heat detector and standard base, It shall have multiple modes with min five different heat sensitivity adjustment from 57 Degree to 90 Degree for static response while working on Rate of Rise response. 360° Visible Tri-coloured led for Normal, Fault and alarm condition, addressing shall be by means of Soft addressing or dip switches or decade switches, or suitable punched cards. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: UL/VDS/EN54. Make: Advanced (UK), Argus (Uk)Simplex, Notifier	4.0	M
71	Market Rate	Providng, Installing, testing and commisioning ofAnalogue Addressable Duct sensor detector of photo electric type, programmable for timed automatic sensitivity (adjustable at site) selection with base and fixing accessories. Detectors shall be UL listed,	2.0	No.
72	(PWD SR 2021-22, Part III, Item 15.110, Page 19(20))	RESPONSE INDICATOR Supplying Installing, testing and commissioning of Response Indictor consists of twin LED wioth electronic circutarx work on 24 DC enclose in PVC retangular. complete including cost of materials, labour, usage charges of machinery complete as per specifications.	4.0	No.
73	Market Rate	Providng, Installing, testing and commisioning ofAnalogue Addressable Fault isolator module capable of monitoring shorted loop circuit and automatically restore communications when shorted conditions are corrected.	2.0	No.
74	(PWD SR 2021-22, Part III, Item 15.69, Page 14(20))	CONTROL MODULE Supply, install, test and commissioning of Analogue addressable Monitor Cum Control (Input/Output) module (1+1) with inbuilt relay and isolator with LED indicator, approved to operate in –10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box, Glands and other mounting accessories for proper installation. In case of Manufacturer with single Input or Output module need to supply One quantity of each for line item. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: EN54. Make: Advanced (UK), Argus, Notifier, Simplex	2.0	No.
75		CONTROL RELAY MODULE Providng, Installing, testing and commisioning ofAnalogue Addressable Control Relay module shall be capable of providing DPDTcontact rated at 24v DC, 2A.	2.0	No.
76	(PWD SR 2021-22, Part III, Item 15.69, Page 14(20))	MONITOR MODULE Supply, install, test and commissioning of Analogue addressable Monitor Cum Control (Input/Output) module (1+1) with inbuilt relay and isolator with LED indicator, approved to operate in –10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box, Glands and other mounting accessories for proper installation. In case of Manufacturer with single Input or Output module need to supply One quantity of each for line item. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: EN54. Make: Advanced (UK), Argus, Notifier, Simplex	2.0	No.

Sl.No.	SR no.	Description	Qty	Unit
77	(PWD SR 2021-22, Part III, Item 15.65, Page 13(20))	HORN/STROBE Supply, Installation, Testing & Commissioning of Analogue Addressable loop powered Sounder & Beacon with inbuilt isolator and having Min 15 distinct sound patterns/ multitone to indicate Exit doors and direct occupants for safe and fast evacuation and 100dB output with minimum 1Hz Frequency flash rate designed for IP65 requirements and approved to operate in -10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box, Glands and other mounting accessories for proper installation. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: VDS/UL/EN54. Make: Advanced (UK), Simplex, Notifier, Argus(UK)	6.0	No.
78	(PWD SR 2021-22, Part III, Item 15.70, Page 13(20))	CONTROL MODULE Supply, install, test and commissioning of Analogue addressable Manual Call Point (Resettable Type) with inbuilt isolator and LED indicator, designed for IP44 requirements and approved to operate in -10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Barriers, Junction Box, Glands and other mounting accessories for proper installation. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: VDS. Make: Advanced (UK), Argus(uk) Simplex Notifier	6.0	No.
79		Supplying, installing, testing and commissioning of Cables as specified under & confirming to IS standards and specifications. Supplying, installing, testing and commissioning of 2 core x 1.5 sq. mm, copper Armoured cables FRLS type confirming to IS standards and specifications. Installed on walls/ ceiling etc, with necessary saddles and hardware as required.	200.0	M
80	Market rate	Supplying, installing, testing and commissioning of 2 core x 1.5 sq. mm, fire servicers type copper Armoured cables FRLS type confirming to IS standards and specifications. Installed on walls/ ceiling etc, with necessary saddles and hardware as required.	200.0	M
81	Market rate	Supplying, installing, testing and commissioning of 2 core x 1.5 sq. mm, copper Armoured cables FRLS type confirming to IS standards and specifications. Installed inside G.I. conduits (25mm dia) & in the trenches buried etc, with necessary accessories.	100.0	M
82	Market rate	MS CONDUIT 25 MM DIA-PROVIDING, installing, testing and commissioning approved make MS conduits on ceiling / wall / floor etc. complete with accessories like, Junction boxes, Collars, Bends etc. 16swg M.S. Conduits ISI	500.0	M
83	Market rate	PERFORATED CABLE TRAY Supplying and fixing of metal trunking (GI) with necessary supports, anchor fasteners etc. complete. Size shall be 40mm x 100mm x 40mm and 2mm thick, for multiple wires / cables/conduits.	50.0	M
84	Market rate	COMPUTER & PRINTER Supply, installation, testing and commissioning of PC with i7 processor, with 3.3GHz, 16 GB RAM, 1 TB HD, 17" LCD color monitor, with A4 size laser jet printer, desk top mounted. DELL/HP/LENOVO	1.0	No.
85	Market rate	BEAM DETECTOR Providing ,fixing, testing and commissioning of beam detectors , this shall have transmitter and receiver with a maximum range of 100 meters and minimum range of 40 meters , it shall have 4 fixed sensitivity levels, 2 automatic variable sensitivity modes, it shall operate in infra red slight spectrum, numerical indicators, standby fault and alarm LED indicators visible from front and bottom +/- 10 degree horizontal & vertical alignment, automatic drift compensation etc., complete.	2.0	No.

Sl.No.	SR no.	Description	Qty	Unit
86	Market rate	Providing's Escape Singage Photoluminescent rigid plastic, 2 mm thickness, Printed on High Quality glass paint with UV resistance, 5 years warranty, Material Used - Non Radiocactive, non-phosphorous, non toxic and lead free. Available in different types & sizes, Time after removing the light source (in minutes) 60 minutes, Luminescent intensity (milicandelas * per square meter - mcd/sqm) : 30 mcd/sqm. Luminescent Intensity greater than 0.32 mcd/sqm, Period of Light Decay* (In Minutes) :3100, including cost of materials, labour, usage charges of machinery complete as per specifications.	6,000.0	No.
87	Market Rate	Supply, installation, testing and commissioning of gas leakage and carbon monooxide detector with all accessories as required,(rate for area protected in sqm).	4.0	No.
		PART E - PUBLIC ADDRESS SYSTEM		
		30 ZONE CONSOLE		
88	(PWD SR 2021-22, Part III, Item 15.114 Page 19(20))	Supplying Installing, testing and commissioning of P.A.System 30 ZONE console panel with push button with speaker and indicator Accomdated in M.S.Cabinet with painting including cost of materials, labour, usage charges of machinery complete as per specifications. 20 zones complete	1.0	No.
89	market rate	Providng, Installing, testing and commissioning of 19" Rack 650mm depth, 42U high amplifier rack assembly made of aluminum channel equivalent to euro rack system, with side and rear panels made of 14 swg powder coated sheet steel front transparent perspex door and with rails, rollers & bearings. Fans shall provided at the top for ventilation side panels will be ventilated type. The rack shall be powder coated of approved color and spare 'U' shall be covered with blank panels.	1.0	No.
90	(PWD SR 2021-22, Part III, Item 15.115, Page 19(20))	P.A.System amplifier 250W RMS out put with complete wiring and controls accessible form front	1.0	No.
91	market rate	Supplying, installing, testing and commissioning of 6 W ceiling mounted type speakers.	4.0	No.
92	(PWD SR 2021-22, Part III, Item 15.115, Page 19(20))	Supplying, installing, testing and commissioning of 6W wall mounted type speakers.	4.0	No.
93		CONTROL CABLES Supplying, installing, testing and commissioning of 2 core x 1.5 sq. mm, copper Armoured cables FRLS type confirming to IS standards and specifications. Installed on walls/ ceiling etc, with necessary saddles and hardware as required.	400.0	M
94		PROVIDING, installing, testing and commissioning approved make MS conduits on ceiling / wall / floor etc. complete with accessories like, Junction boxes, Collars, Bends etc. 25 MM DIA	400.0	M
95		GI PERFORATED CABLE TRAY PROVIDING and fixing of perforated G.I.sheet cable tray with necessary angle iron suspension supports, anchor fasteners etc. complete. Maximum height of suspension shall not exceed 500 mm.Size of the tray is 40mm x 200mm x 40mm and 2mm thick.	50.0	M

BOQ
Electrical Works

Sl. No.	DESCRIPTION OF THE WORK	UNIT	QTY
1	2	3	4
I	INTERNAL ELECTRIFICATION WORKS		
1	Supplying and wiring adopting loop system in existing PVC Conduit /casing capping casing capping using 2x1.5sqmm (Phase & Neutral) & 1x1.0 sqmm (Earth wire) FRLS multi strand PVC insulated copper wire (confirming to IS-694: and latest amendments) without control switch shall be fixed on the existing plastic sheet/gang box, the other end of the wires shall be terminated with sufficient loose length in a wood/PVC round block. complete for each outlet. (Group A).		
	a) Medium point above 3Mtr upto 6Mtr from tapping point to outlet via switch box.	Each	16
	b) Two outlet in a row, above 3Mtr upto 6Mtr from tapping point to outlet via switches.	Each	4
	c) Three outlet in a row, above 6Mtr upto 10Mtr from tapping point to outlet via switches.	Each	1
2	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100V grade, multistrand copper wire with low conductor resistance single core in open or concealed system of wiring with specified IS-694:confirming to latest amendments.		
	a) 1 sqmm.	RM	200
	b) 1.5 sqmm.	RM	500
	c) 2.5 sqmm.	RM	600
	d) 4.0 sqmm.	RM	500
3	Supplying heavy guage PVC conduit pipe 19/20/25/32/40 mm dia 2 mm thick confirming to IS 2509 with suitable size bends, metal/PVC junction boxes, adhesive paste etc., and running before concreting the slab. The conduit should be tied to the reinforcement rods by using binding wires and unused ways of junction boxes and pipe ends should be covered using PVC end enclosures, run with 18 SWG GI fish wire wherever necessary.		
	a) 19/20mm dia 2 mm thick.	RM	400
	b) 25mm dia 2 mm thick.	RM	500

4	Supplying and fixing PVC/metal conduit deep junction box.		
	a) 19/20mm deep junction box.	Each	15
	b) 25mm deep junction box.	Each	5
5	Extra for groove cutting in brick wall/cc floor to the suitable depth for concealing of conduit/GI pipe and plastering, finishing upto wall surface complete.		
	a) Upto 50mm conduit in brick wall.	RM	100
	b) Upto 50mm conduit in CC floor.	RM	100
6	Fabricating supplying and mounting MS box made out of 16 SWG suitable for floor / wall mounting, fully weather proof with provision for better heat dissipation, provided with hinged front cover, equipped with tamper proof locking arrangements, with suitable size clamps with necessary cable entry pipe with gland and box should be finished with 7tanks treatment with powder coated paint and finally finished with approved colour etc., complete.		
	16 SWG.	Sqcm	2000
7	Supplying and fixing flush mounting powder coated/galvanized metal box suitable for mounting modular switch plates. The box should be firmly flush mounted after due groove cutting in brick/stone/CC wall.		
	a) 1 - 3 way	Each	2
	b) 4 - 5 way	Each	15
	c) 6 way	Each	7
8	Supplying and fixing superior quality modular switch mounting polycarbonate plate with necessary supporting back plate with required nos. of machine screws, bolts nuts etc., complete on the existing metal/PVC box.		
	a) 1to 3 Module.	Each	2
	b) 4 Module.	Each	15
	c) 6 Module.	Each	7
9	Supplying and fixing of modular switch/ socket/ stepped electronic fan regulator/ dimmer/ telephone socket etc on existing modular switch plate as per IS 3854 and IS 1293.		
	a) 6Amps one way.	Each	12
	b) 6Amps three way socket.	Each	12
	c) 32Amps DP switch	Each	2
	d) 6/16Amps universal socket	Each	2
10	Supplying and fixing of metal clad industrial plugs and sockets.		
	a) 2pole+earth 250V PLUG. 10 Amps	Each	15
	b) 2pole+earth 250V SOCKET 10 Amps	Each	15
	c) 3pole+earth 440V PLUG. 30 Amps	Each	5
	d) 3pole+earth 440V SOCKET 30 Amps	Each	5
11	Supplying 4mm thick plastic sheet with necessary niches for fixing switches, regulators etc., and fixing on existing wooden or metal box using N.F. screws.	Sqcm	1000

12	Supplying and fixing regular MCB distribution boards on wall/ wood board / flush mounting using required clamps, bolts, nuts etc., with provision for fixing suitable type capacity MCB's single phase / 3 phase / single door with powder coated painting. Made out of 14 SWG MS enclosure.		
	a) 6Way SP &N	Each	2
	b) 8Way SP &N	Each	1
	c) 4Way TP &N	Each	1
	d) 4 Way SP & N	Each	2
13	Supplying and fixing miniature circuit breakers on existing MCB distribution boards using necessary fixing materials and 'C' Type curve, indicator ON/OFF, energy cross-3 with Short circuit breaking capacity of 10K and complete wiring as required confirming to IEC 60898.		
	6 to 32Amps SP.	Each	26
	50 to 63Amps TPN.	Each	2
14	Supplying, fixing and wiring Residual current circuit breaker (RCCB) 240/450V up to 300mA sensitivity on existing wood/ panel board.		
	a) 16A-25 Amps 2 pole	Each	3
	b) 32A-40 Amps 4 pole	Each	1
II	FITTINGS AND FIXTURES		
1	Supplying offeet - PVC Batten with integrated LED tube.....W with high quality diffuser with Life of 25000 burning hours & 70% lumen maintenance with CRI > 80. Power Input: 220-240V @ 50/60Hz & Power factor >0.9 along with CE approved. 2 years Warranty against any manufacturing defect working under standard electrical condition.		
	LED light fighting 2x 4' - 20 /22 w	Each	7
2	Supply of round/square recess/surface mounted rolling type LED Down light withW GU 10 LED Lamp Rib Fabricated from Die cast aluminium with white powder coated prewired to mains connector & has swiveling unit of aluminium die cast eye ball & LED Lamp position retained by circular wire spring, with Life of 25000 burning hours & 70% lumen maintenance with CRI > 80. Power Input: 220-240V @ 50/60Hz & Power factor >0.9 along with CE approved. 2years Warranty against any manufacturing defect working under standard electrical condition		
	LED square or round down light 10-12W	Each	6
3	Supplying and fixing square/round/oblong type bulk head light fitting with 10W LED lamp with all accessories. (Havell's/ Panasonic or equivalent).	Each	5
4	15 Watts LED, wall bracket light fixture as per consultant choice with suitable drivers, SPD (2.5KV).	Each	4
5	10 Watts LED, wall mirror light fixture as per consultant choice with suitable drivers, SPD (2.5KV).	Each	2
6	Supplying exhaust fan of 1440 RPM of 300mm (12") size with bracket blades complete for light duty suitable to operate on 230V 50Hz, AC Supply.	Each	2
7	Supplying of 1440rpm heavy duty exhaust fan with bracket blades suitable to operate on 230V 50Hz, AC Supply complete.		
	15" Sweep (450mm)	Each	6

8	Supplying wall mounting fan suitable to operate at singlephase 230v A.C. supply.		
	400mm Sweep	Each	1
9	Supplying and fixing wall mounting fans (air circulator fans) 600mm (24") sweep, suitable for operation on 250V, 50Cy. AC supply complete with oscillating facility, wall mounting bracket, metallic blades, capacitor, built in three speed regulator, mesh guard and other accessories. (Havells /Bajaj /Almonard or equivalent).	Each	4
10	Supplying, erecting, testing and commissioning of flameproof & weatherproof LED light fixtures suitable for 90W, 250V AC, 50Hz, LLF Moonstar 61 series as per IS/IEC 60079-1, IP-66 standard as per IS/IEC 60529 with die cast aluminium alloy body with heat, resistant & toughened clear dome glass. Dark admiralty grey epoxy powder coated shade paint, with all accessories. Prices include all the necessary accessories for fixing the light fixtures from the truss at a convenient height.	Each	13
11	Supply of LED Street light luminaire with pressure die cast aluminium housing body for optimal thermal dissipation. Lamp compartment comprising of anti glare clear diffuser with Injection moulded polycarbonate material, delivering superior light output. Rated life Burning Hrs 50000 hr @ Lumen Maintenance of 70%, maximum light intensity should be between 60 degrees to 70 degrees. CCT > 5500K, IP66 optical and electrical compartment & impact resistance of complete luminaire > IK08. Power Factor >0.9 with mains, Surge Protection- Min 5KV along with Over voltage/Overload, short circuit/ miss-wiring protection. Compatible for pole mounting with outer dia of 40mm to 50mm. Universal Voltage driver to operate wide voltage range from 100V to 270V 50/60Hz application. Compliance to IS 10322/IEC 60598, LM 79 & LM 80 Adherence with RoHS. UL approved MCPCB. Top access street light with single screw to ensure ease of maintenance at the sight site location with minimized minimal tools. LED Light fixture withW System Power consumption. LED Efficiency>130lm/w, nominal CRI >75. Luminaire manufacturer should have in-house facility accredited by NABL/CPRI & any Government certified agency & Design & Development facility certified by ISO 9001:2008 . Housing with supplier word mark /name shall be Engraved / Embossing on the die cast housing/ Body part. Warranty of 2 Years against any manufacturing defect working under standard electrical conditions as mentioned above should be given by LED manufacturer & Cree/Nichia/ Lumileds/Osram make LED Source.		
	LED Streetlight 40watts	Each	11
12	3 Watts LED, wall up light fixture as per consultant choice with suitable drivers, SPD (2.5KV).	Each	25
13	Fixing all types and all capacities of fluorescent / false ceiling/ spot light / CFL / LED fittings indoor on the wall / ceiling /rafters / girders using 23/0.0076" twin twisted PVC insulated wires, required Nos of round blocks and clamps.		
	On wall / ceiling / Rafter / Girders	Each	19

14	Fixing a ceiling / Wall mounting fan of all capacities and all types to the existing 'S' hook with fan regulator to the existing board together with supplying and fixing 5 amps. ceiling rose, necessary length of 23 / 0.0076 inch PVC insulated twin twisted copper wire and wiring.	Each	1
15	Fixing one exhaust fan in the nitch already left in the wall with bolts and nuts and 5 amps. ceiling rose with sufficient length of 23 / 0.0076 inch PVC insulated twin core wire.	Each	8
III	PANELS, UG CABLE AND ALLIED WORKS		
1	a) Main LT Panel		
1	<p>Supplying, erecting, testing and commissioning of sheet steel fabricated (14/16 gauge) Medium Voltage main control Panels, cubicle type with hinged front door with locking arrangements. The board shall be free standing type, dust and vermin proof, having provision for extension on both sides. The boards shall be supplied with the following equipments necessary bus bars, etc., including inter connections as required. The board shall be provided with detachable plate at top and bottom of cable alley, having adequate knockouts for facilitating conduit/cable entries. The board shall be fixed firmly on a 150mm high concrete pedestal with bolt and nuts, finished neatly with plastering etc., complete. The board shall be applied with one coat of primer after cleaning and degreasing the metallic surfaces and finished neatly with powder coated paint of approved colour. (MR)</p> <p><u>Incoming Feeders</u></p> <p>2 Nos - 250A/315A, 4P, 36KA, moulded case circuit breaker TM based with motorised and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 No - 250A/315A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 No - 160A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 No - Multi Data Meter (A,V,KW,KVA & PF) (Converz or equivalent)</p> <p>1 No - Earth Fault Relay with CBCT (Converz or equivalent)</p> <p>4 Sets - RYB phase indicator lamps set with switches and fuses.</p> <p>4 Sets - Breaker ON / OFF, trip indicating lamps</p> <p>1 Set - EB/DG ON / OFF indicating lamps with protection fuses.</p> <p>1 Set - Electrical / Mechanical interlocking system.</p> <p>1 Set - Emergency stop button</p> <p>1 Set 400A aluminium bus bars (RYB & N)</p> <p>1 Set 2Rx25x3 copper bus bar (Earthing)</p> <p><u>Outgoing Feeders</u></p> <p>2 Nos - 160A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 Nos - 100A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 No - 63A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts.</p> <p>1 No - 63A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts. (Spare space)</p>		

1 No - 40A, TP+N, 10KA MCB's 1 No - 63A, TP+N, 10KA MCB's (Spare space) 1 No - 25A, DP, 10KA MCB's	Each	1
b) Sub- Main Panel Supplying, erecting, testing and commissioning of sheet steel fabricated (14/16 gauge) Medium Voltage main control Panels , cubicle type with hinged front door with locking arrangements. The board shall be free standing type, dust and vermin proof, having provision for extension on both sides. The boards shall be supplied with the following equipments necessary bus bars, etc., including inter connections as required. The board shall be provided with detachable plate at top and bottom of cable alley, having adequate knockouts for facilitating conduit/cable entries. The board shall be fixed firmly on a 150mm high concrete pedestal with bolt and nuts, finished neatly with plastering etc., complete. The board shall be applied with one coat of primer after cleaning and degreasing the metallic surfaces and finished neatly with powder coated paint of approved colour. (MR) Incoming Feeders 1 No - 160A, TP+N, 36KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts. 1 No - Multi Data Meter (A,V,KW,KVA & PF) (Converz or equivalent) 1 No - Earth Fault Relay with CBCT (Converz or equivalent) 1 Set - RYB phase indicator lamps set with switches and fuses. 1 Set - Breaker ON / OFF, trip indicating lamps 1 Set 200A aluminium bus bars (RYB & N) 1 Set 25x3 copper bus bar (Earthing) Outgoing Feeders 1 No - 125A, TP+N, 25KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts. 1 No - 100A, TP+N, 25KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts. 2 Nos - 63A, TP+N, 25KA, moulded case circuit breaker TM based with RHOM, and additional 2 NO & 2 NC auxiliary contacts. 5 Nos - 40A, TP+N, 10KA MCB's 2 Nos - 25A, TP+N, 10KA MCB's 2 Nos - 25A, DP, 10KA MCB's 1 Nos - 40A, TP+N, 10KA MCB's (Spare space) 1 Nos - 63A, TP+N, 10KA MCB's (Spare space)	Each	1

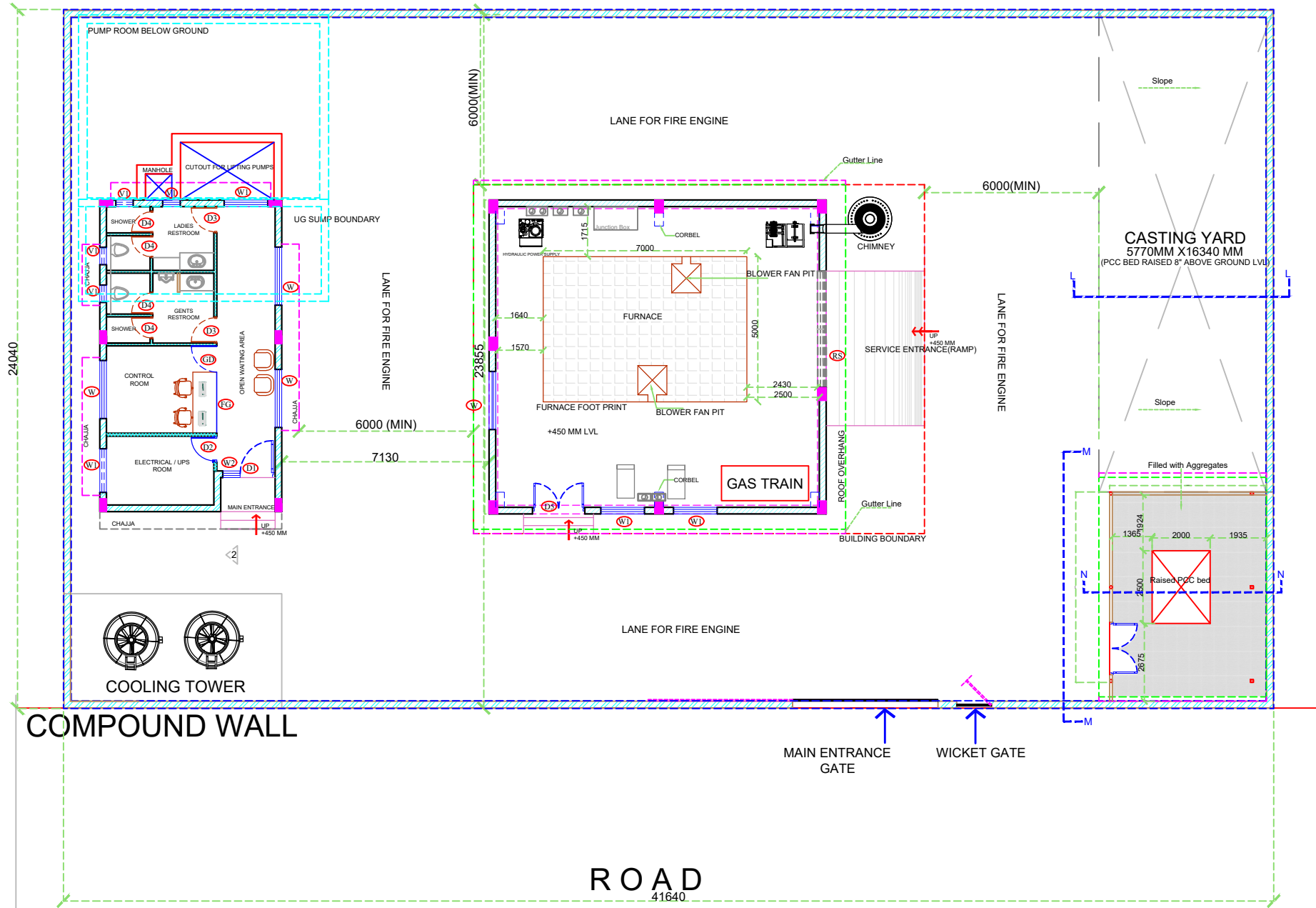
2	<p>Supplying of Automatic power factor correction panel with APFC relay including 40 KVAR capacitor banks etc., complete as required. Capacitor panel shall be dead front indoor type dust and vermin proof hinged and lockable doors at back side complete with interconnections, cables glands, removable gland plates, lugs bonding to earth with 2 independent earth connections having 2 Nos.25 x 6 mm Cu strip at bottom of panel and painting off white colour inside and outside, (suitable for 400/440V 3-phase 50Hz supply system).The panel shall be provided with legend plate showing panel No. and name of the panel for outgoing feeder details and amperage of main incoming respectively. The panel shall be applied with one coat of primer after cleaning and degreasing the metallic surfaces and finished neatly with two coats of approved colour powder coated.</p> <p><u>Incoming Feeders</u></p> <p>1 No - 160A, TP&N 36KA, Moulded Case Circuit Breaker, TM based, with RHOM, 2 'NO' + 2 'NC', auxillary contacts.</p> <p>1 Set 200A copper bus bars (RYB & N)</p> <p>1 Set RYB phase indicator lamps set with switches and fuses. [Vaishnov or equivalent].</p> <p>1 No. Multi Data Meter indicating Voltage, Ampere, KW and PF. [Electrex/Enercon/HPL or equivalent]</p> <p>1 No. 4 stage power factor correction relay. (Epcos / Beluk / Ducati / Phasitron or equivalent)</p> <p>1 No - 160/ 5 Amp, class 1, current transformer</p> <p>1 No - Auto / Mannual selector switch.</p> <p>1 No - Emergency stop button.</p> <p>4 sets of ON-OFF push button station red & green with 'ON' & 'OFF' indicating lights for each capacitor unit to indicate its position.</p> <p>1 No. Time Delay Relay.</p> <p>1 No. No Volt Relay.</p> <p><u>Outgoing Feeders</u></p> <p>2 Nos. 40A, TP MCB capacitor duty.</p> <p>2 Nos. 25A, TP MCB capacitor duty.</p> <p>2 Nos. 40A, TP Contactor with 2 NO & 2NC contacts and 230A AC coil.</p> <p>2 Nos. 25A, TP Contactor with 2 NO & 2NC contacts and 230A AC coil.</p> <p>2 Nos. 15 KVAR shunt capacitor units of metalized polypropylene type. (Siemens Epcos / Neptune Ducati or equivalent)</p> <p>1 No. 10 KVAR shunt capacitor units of metalized polypropylene type. (Siemens Epcos / Neptune Ducati or equivalent)</p> <p>1 No. 10 KVAR shunt capacitor units of metalized polypropylene type. (Siemens Epcos / Neptune Ducati or equivalent) (Space provision)</p> <p>Toggle /rotary switch (double throw) for changing operation of capacitor Auto OFF - MANUAL.</p> <p>Note :- The arrangement drawings for the panels shall be got approved by the Engineer - in -charge /Electrical Consultant before commencement of fabrication.</p>	Each	1
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3	Supplying and laying following size L.T. underground armoured cable with aluminium conductor in ground /cable trench / cabletrace, including necessary earth work, sand and brick protection, refilling and consolidation etc., where ever required.		
	a) 3.5 core 240 sqmm	RM	1000
	b) 3.5 core 50 sqmm	RM	50
	c) 3.5 core 35 sqmm	RM	150
	d) 3.5 core 25 sqmm	RM	70
	e) 4 core 10 sqmm	RM	20
	f) 4 core 6 sqmm CU AR	RM	220
	g) 4 core 4 sqmm CU AR	RM	50
	h) 4 core 2.5 sqmm CU AR	RM	100
	i) 3 core 4 sqmm CU AR	RM	100
4	End termination of above L.T. cables with brass glands, copper lugs, (crimping type) etc., including necessary connections as required complete.		
	a) 3.5 core 240 sqmm	Each	4
	b) 3.5 core 50 sqmm	Each	4
	c) 3.5 core 35 sqmm	Each	4
	d) 3.5 core 25 sqmm	Each	2
	e) 4 core 10 sqmm	Each	2
	f) 4 core 6 sqmm CU AR	Each	12
	g) 4 core 4 sqmm CU AR	Each	6
	h) 4 core 2.5 sqmm CU AR	Each	4
	i) 3 core 4 sqmm CU AR	Each	4
5	Supplying and fixing 2mm thick perforated cable GI tray with on existing MS angle support using necessary GI bolts/nuts and washer or welding as required.		
	300x50mm	RM	25
6	a) Supplying fixing and connecting G.I. Pipe earth electrodes for grounding metering cubical,fencing, sub-distribution boards, switch boards and other equipments using 40 mm dia, 2.5M long 'B' class G.I.pipe, buried in a pit as per I.S. 3043, including 1.25M long, 20 mm dia, 'B' class G.I.pipe, funnel arrangement, C.I. chamber cover, etc.,The earthing shall be carried out as per drawing issued.	Each	8
7	Supplying and running of GI/Copper strips for grounding connections, using necessary fixing materials as required.		
	25 x 6 mm G.I. strip	RM	200
8	Supplying and fixing lightning arrester made out three inches dia sphere with 5 sprongs, 25mm dia 1 Mtr long copper tube,base plate necessary clamping arrangement to connect earth contunity conductors with necessary hardware and other accessories complete	Set	1
9	Supplying and fixing twin aviation lamp with necessary bracket 1 Mtr long 25mm dia, G.I. pipe with necessary base plate and hardware. Aviation lamp supplied with (Bajaj or equivalent) supplied with neon type lamp of suitable lighting with accessories complete.	Each	2
IV	DATA NETWORKING AND ALLIED WORKS		

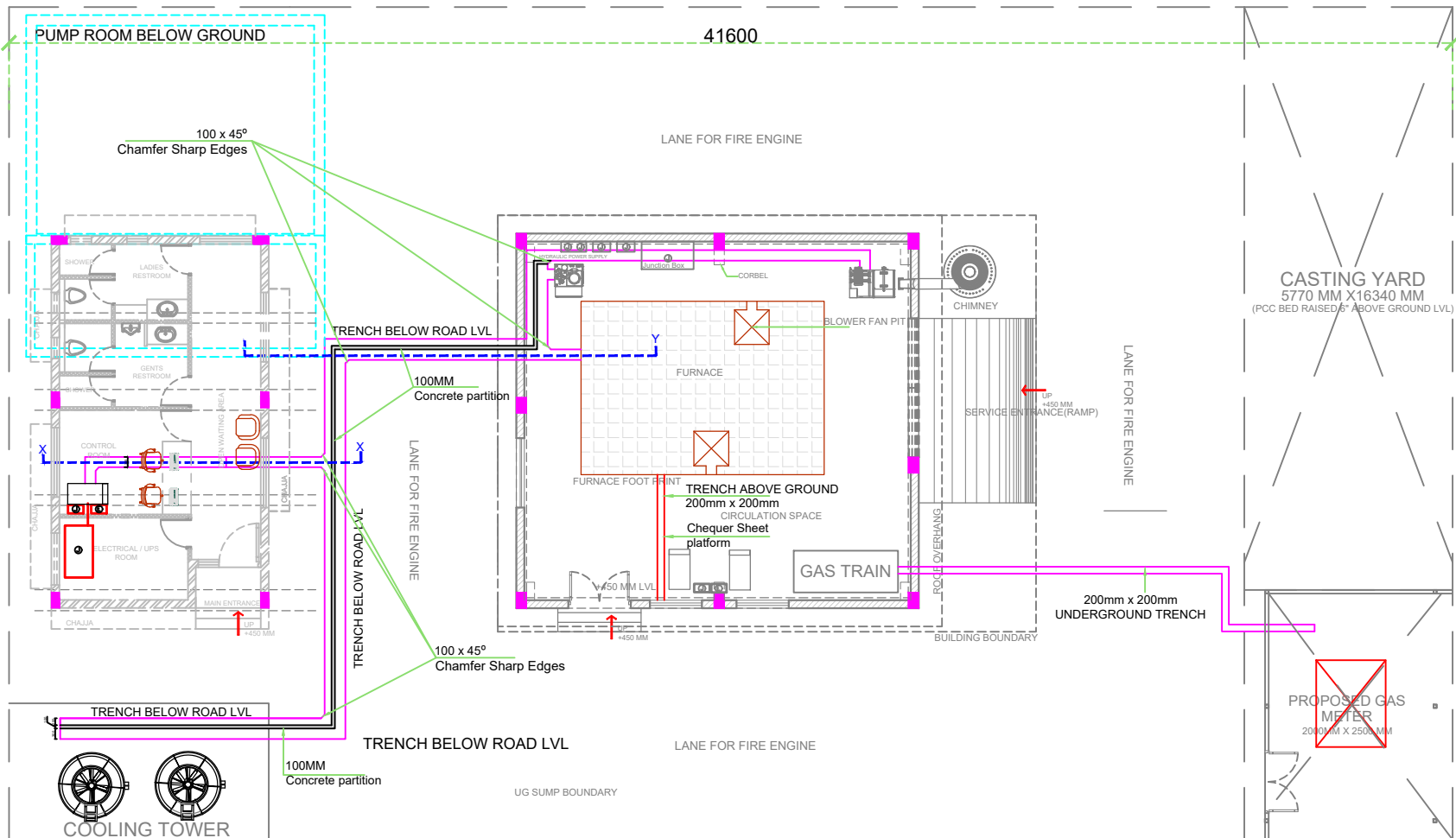
1	Supplying & fixing of I/O socket with back box		
	Single I/O	Each	4
2	Supplying and drawing UTP-CAT 6E LAN cable.	RM	300
3	Supplying heavy guage PVC conduit pipe 19/20/25/32/40 mm dia 2 mm thick confirming to IS 2509 with suitable size bends, metal/PVC junction boxes, adhesive paste etc., and running before concreting the slab. The conduit should be tied to the reinforcement rods by using binding wires and unused ways of junction boxes and pipe ends should be covered using PVC end enclosures, run with 18 SWG GI fish wire wherever necessary.		
	25mm dia 2 mm thick.	RM	200
4	Supplying & Fixing of switch mounting rack with power manager & Cable manager.		
	12U with 450mm depth	Each	1
5	Supplying fixing of Network Switches		
	16 Port 10/100/1000 Switch	Each	1
6	Supplying & Fixing of ... ms Cat 6 Patch Cable		
	3 m	Each	10
7	Supplying & Fixing of Patch panel for LAN cabling		
	16 Port 10/100/1000 patch panel	Each	1

Item 14

Master plan



GENERAL NOTES				
ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.				
ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/STRUC. CONSULTANT BEFORE EXECUTION.				
ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.				
ARCHITECTURAL NOTES				
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE				
SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
REVISIONS				
R0				
R1 07-05-2022				
PRISTINE DESIGN STUDIO				
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094				
CONSULTANTS				
ELECTRICAL CONTRACTOR				
HVAC CONTRACTOR				
PROPOSAL				
STAMP				
PRJ. NO. PDS/1617/16				
DEALT BY		CHECKED BY		
NIVA		SV		
SCALE		DATE		
N/S		16 12 2019		
UNITS: MM				
DWG. NO. PDS/16.12.2019				
BUILT UP AREA, TEST FACILITY: 126 SQFT.				
CONTROL ROOM BUILDING: 730 SQFT.				
DRAWING TITLE				
SITE PLAN				
SHEET 01				
CLIENT				
M/s IISC				
ADDRESS:				
CV Raman Rd, Bengaluru, Karnataka				
155				
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GENERAL NOTES
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ARCHITECTURAL NOTES
 COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	DESCRIPTION	DATE
R0		
R1		07-05-2022

REV	DATE	BY	CHKD

PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE ACES LAYOUT, SANJAYNAGAR, RMV, 2ND STAGE BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/167/16	DEALT BY	CHECKED BY
	NVA	SV
	SCALE	DATE
	1:1	16 12 2019
	UNITS	MM
	DWG. NO. PDS/167/16/01	
	BUILT-UP AREA, TEST FACILITY-126 SQFT, CONTROL ROOM BUILDING- 732 SQFT	

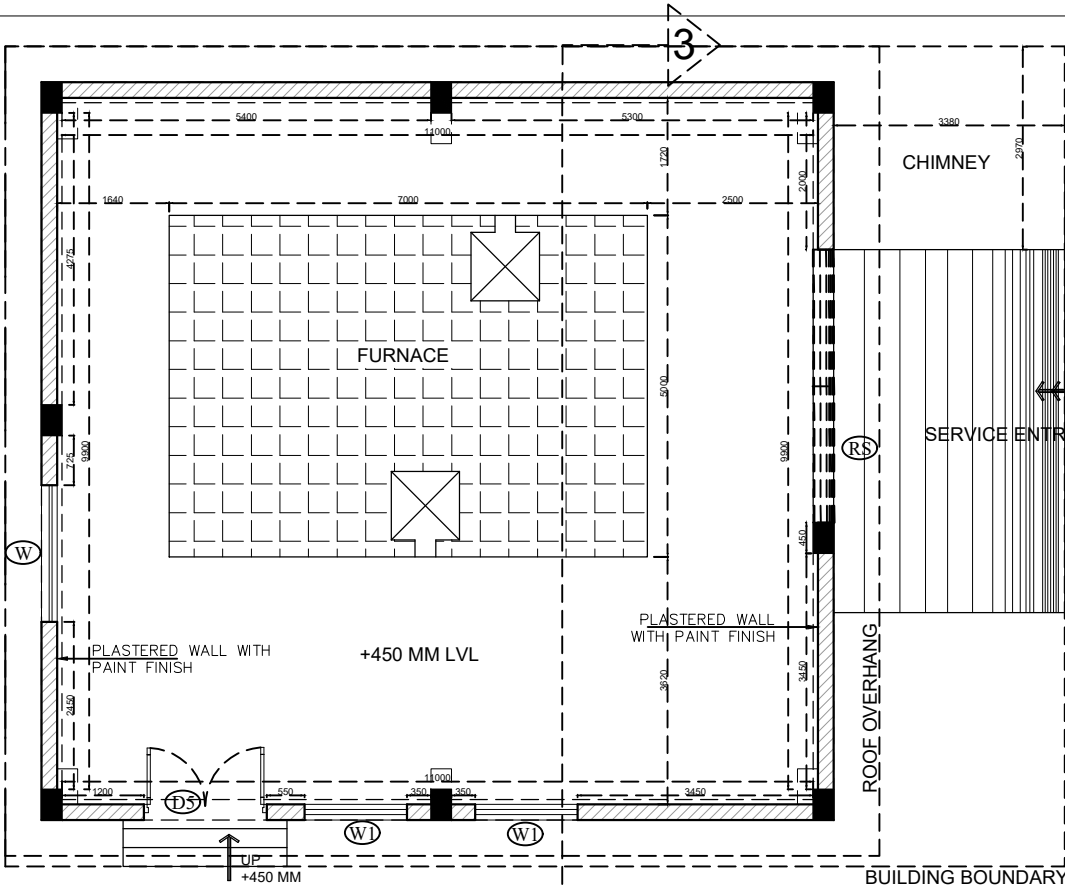
DRAWING TITLE
 PLAN SHOWING TRENCH DETAILS (01/02)

CLIENT
 M/s IISC
 ADDRESS:

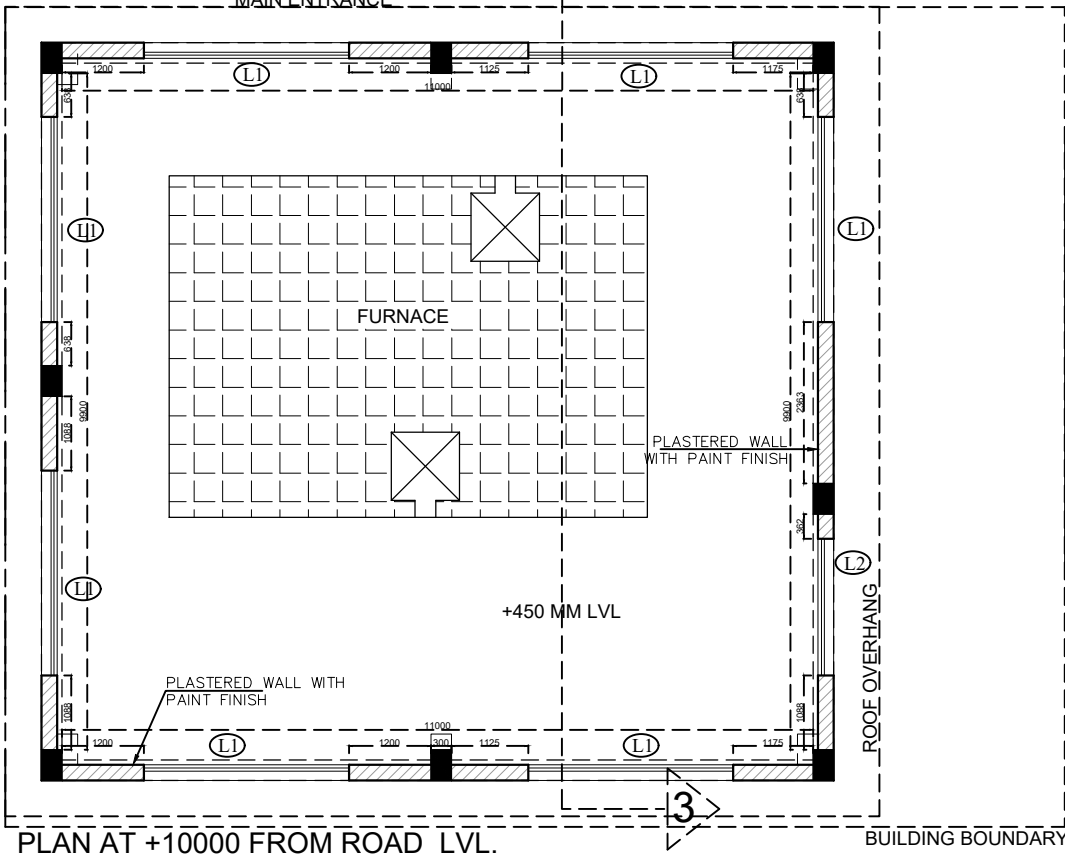
CV Raman Rd, Bengaluru, Karnataka

COMPOUND WALL

ROAD



PLAN AT +1100 FROM ROAD LVL.



PLAN AT +10000 FROM ROAD LVL.

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
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ALL STRUCTURAL DRGS. ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

ARCHITECTURAL NOTES

9" BRICK WALL

SCHEME TENDER INFORMATION APPROVAL CONSTRUCTION

DOOR WINDOW SCHEDULE

Type	Size	Sill ht.	Lintel ht.	Nos.	Description
W	2000 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W1	1500 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W2	600 x 1950	450	2400	01	Aluminum Powder Coated operable Window
FG	2100 x 1950	450	2400	01	Aluminum Frame Fixed Glass
LOUVERS					
L1	4000 x 2000	9018	11018	03	METAL LOUVERS
L2	2000 x 2000	9018	11018	01	METAL LOUVERS
VENTILATORS					
Type	Size	Cill ht.	Lintel ht.	Nos.	Description
V1	600 X 900	1500	2400	04	Aluminum Powder Coated Ventilator
DOORS:					
Type	Size	Lintel ht.	Nos.	Description	
D	1800 x 2400	2400	01	Metal Door (Fire Rated)	
D1	1200 x 2400	2400	01	Metal Door (Fire Rated)	
D2	900 x 2400	2400	01	Metal Door (Fire Rated)	
D3	750 x 2400	2400	02	Metal Door (Fire Rated)	
D4	750 x 2400	2400	02	Flush Doors	
DOOR and WINDOWS:					
Type	Size	Lintel ht.	Nos.	Description	
RS	4000 x 6000	6000	01	Rolling shutter	



PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No.
 164, 1st CROSS, 1st STAGE ACES LAYOUT,
 SANJAYNAGAR, RMV 2ND STAGE
 BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/1617/16	DEALT BY MOKSHA	CHECKED BY SV
	SCALE NTS	DATE 06 09 2021
	UNITS MM	
DWS.No.PDS/16-12-2019 BUILT UP AREA- TEST FACILITY-1280 SQFT. CONTROL ROOM BUILDING- 730 SQFT		

DRAWING TITLE

FURNACE BUILDING SHEET 02

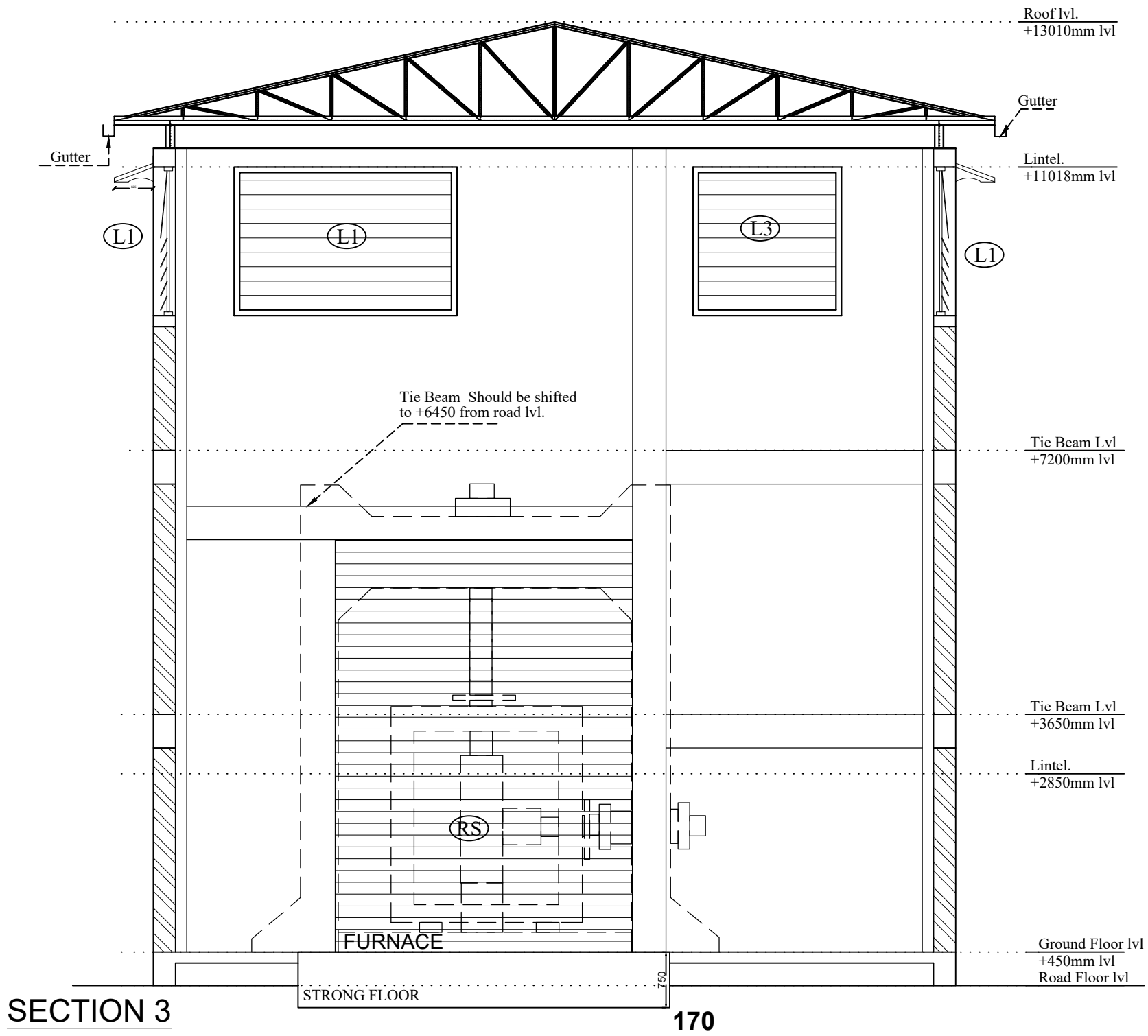
CLIENT

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ADDRESS:

CV Raman Rd, Bengaluru, Karnataka

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Roof lvl.
+1310mm lvl

Lintel.
+11018mm lvl

Tie Beam Lvl
+7200mm lvl

Tie Beam Lvl
+3650mm lvl

Lintel.
+2850mm lvl

Ground Floor lvl
+450mm lvl
Road Floor lvl

Tie Beam Should be shifted
to +6450 from road lvl.

SECTION 3

STRONG FLOOR

750

170

GENERAL NOTES
ALL DIMENSIONS IN FT AND INCHES FOLLOW WITHIN DIMENSIONS.
ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/STRUC. CONSULTANT BEFORE EXECUTION.
ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

ARCHITECTURAL NOTES
APVD. PAINT FINISH
EXPOSED BLOCK WORK

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

DOOR WINDOW SCHEDULE

TYPE	Size	Shil	Unit	Qty	Description
W	2000 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W1	1500 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W2	600 x 1950	450	2400	01	Aluminum Powder Coated Sliding Window
W3	1100 x 1950	450	2400	01	Aluminum Frame Fixed Glass

LOUVERS	Size	Shil	Unit	Qty	Description
L1	600 x 2000	9018	11018	03	METAL LOUVERS
L2	2000 x 2000	9018	11018	01	METAL LOUVERS

VENTILATORS	Size	Shil	Unit	Qty	Description
V1	600 X 900	1500	2400	04	Aluminum Powder Coated Ventilator

DOORS	Size	Unit	Qty	Description
D	1800 x 2400	2400	01	Metal Door (Fire Rated)
D1	1200 x 2400	2400	01	Metal Door (Fire Rated)
D2	900 x 2400	2400	01	Metal Door (Fire Rated)
D3	750 x 2400	2400	02	Metal Door (Fire Rated)
D4	750 x 2400	2400	02	Flush Doors

DOOR and WINDOWS	Type	Size	Unit	Qty	Description
RS		4000 x 6000	6000	01	Rolling shutter

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP

PRJ. NO. PDS/1617/16	DEALT BY MOKSHA	CHECKED BY SV
	SCALE N/S	DATE 06/09/2021
	UNITS MM	
	DATE PDS/16.12.2019	
	BUILT UP AREA: TEST FACILITY: 126 SQFT. CONTROL ROOM BUILDING: 730 SQFT.	

DRAWING TITLE

ELEVATIONAL DETAIL OF MAIN BUILDING SHEET 03

CLIENT

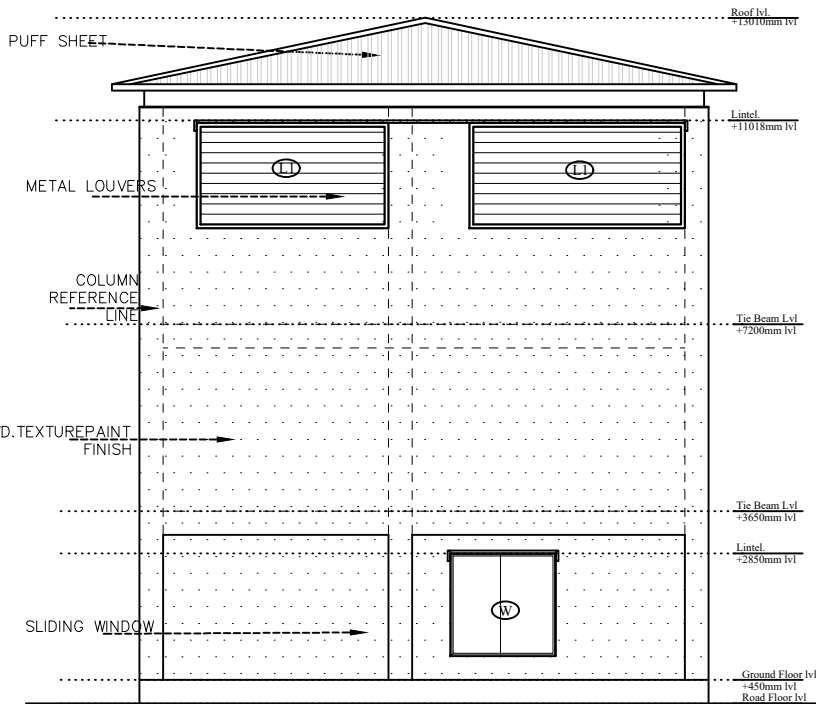
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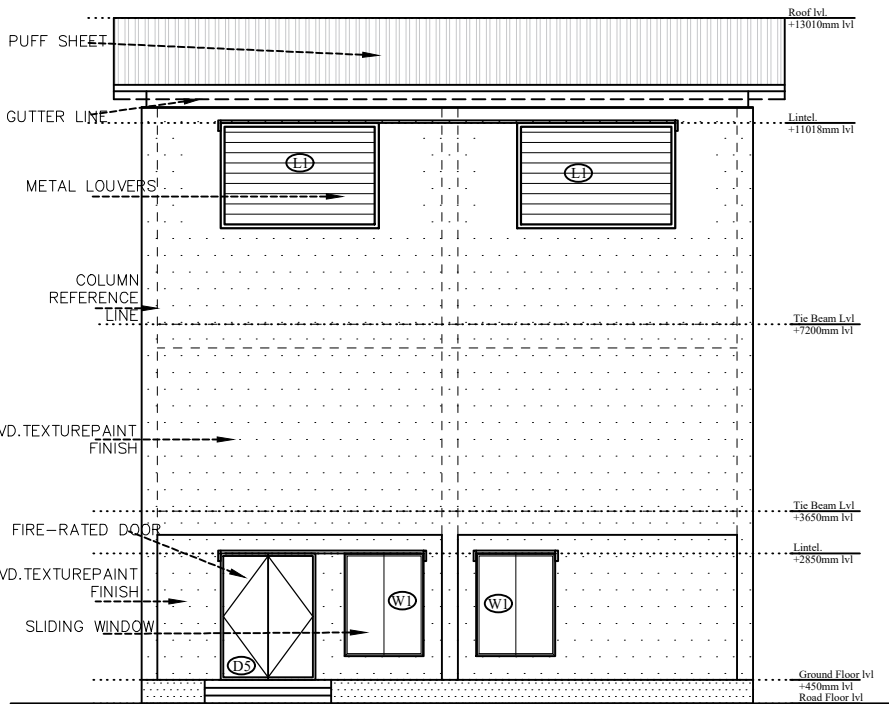
CV Raman Rd, Bengaluru, Karnataka 560094

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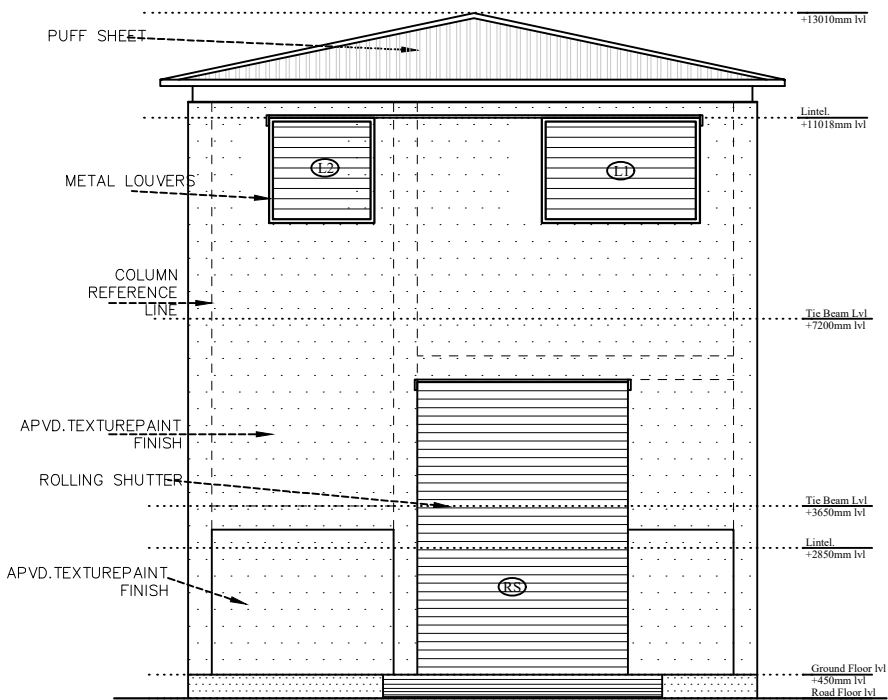
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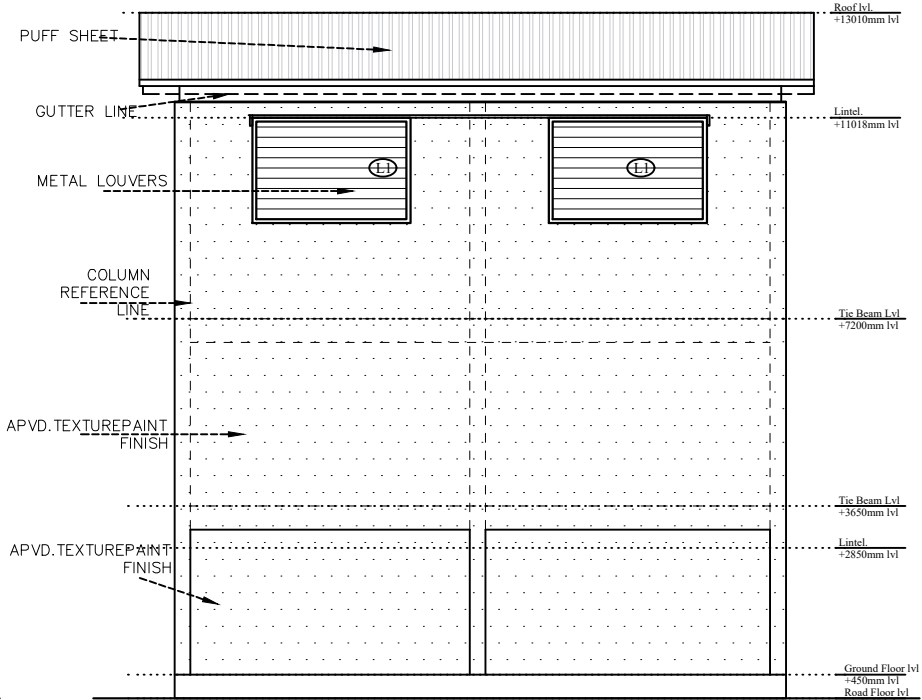
WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION



NORTH ELEVATION

GENERAL NOTES
 ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
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 ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

ARCHITECTURAL NOTES
 APVD. PAINT FINISH

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

DOOR WINDOW SCHEDULE

WINDOWS:					
Type	Size	Sill Ht	Lintel Ht	No.	Description
W	2000 x 1950	450	2400	03	Aluminium Powder Coated Sliding Window
W1	1500 x 1950	450	2400	03	Aluminium Powder Coated Sliding Window
W2	600 x 1950	450	2400	01	Aluminium Powder Coated Sliding Window
FG	2100 x 1950	450	2400	01	Aluminium Frame Fixed Glass

LOUVERS:					
Type	Size	Sill Ht	Lintel Ht	No.	Description
L1	4000 x 2000	9018	11018	03	METAL LOUVERS
L2	2000 x 2000	9018	11018	01	METAL LOUVERS

VENTILATORS:					
Type	Size	Sill Ht	Lintel Ht	No.	Description
V1	600 X 900	1500	2400	04	Aluminium Powder Coated Ventilator

DOORS:					
Type	Size	Sill Ht	Lintel Ht	No.	Description
D	1800 x 2400	2400	2400	01	Metal Door (Fire Rated)
D1	1200 x 2400	2400	01	Metal Door (Fire Rated)	
D2	900 x 2400	2400	01	Metal Door (Fire Rated)	
D3	750 x 2400	2400	02	Metal Door (Fire Rated)	
D4	750 x 2400	2400	02	Flush Doors	

DOOR and WINDOWS:					
Type	Size	Sill Ht	Lintel Ht	No.	Description
RS	4000 x 6000	6000	01	1	Rolling shutter

PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, ACE'S LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE - 560094

CONSULTANTS
 ELECTRICAL CONTRACTOR
 HVAC CONTRACTOR

PROPOSAL
 STAMP

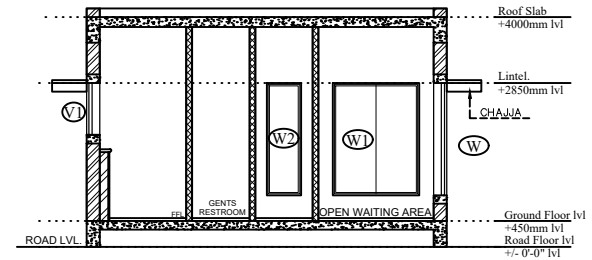
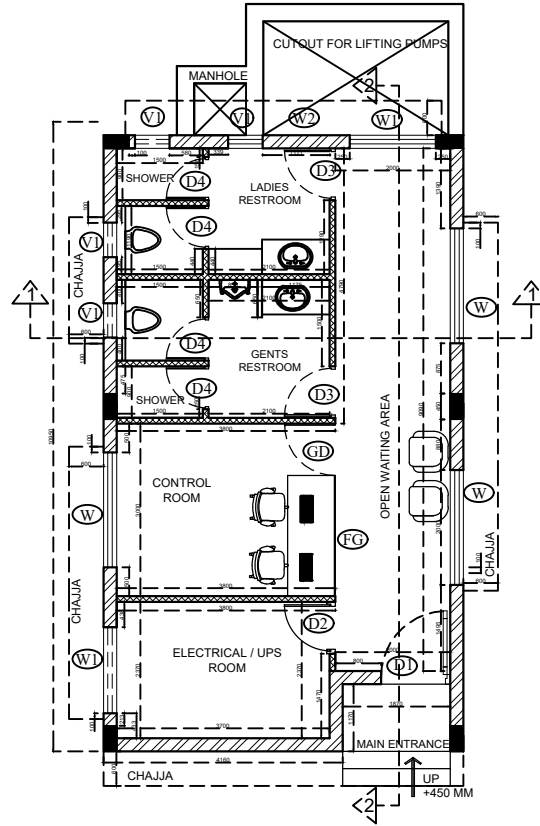
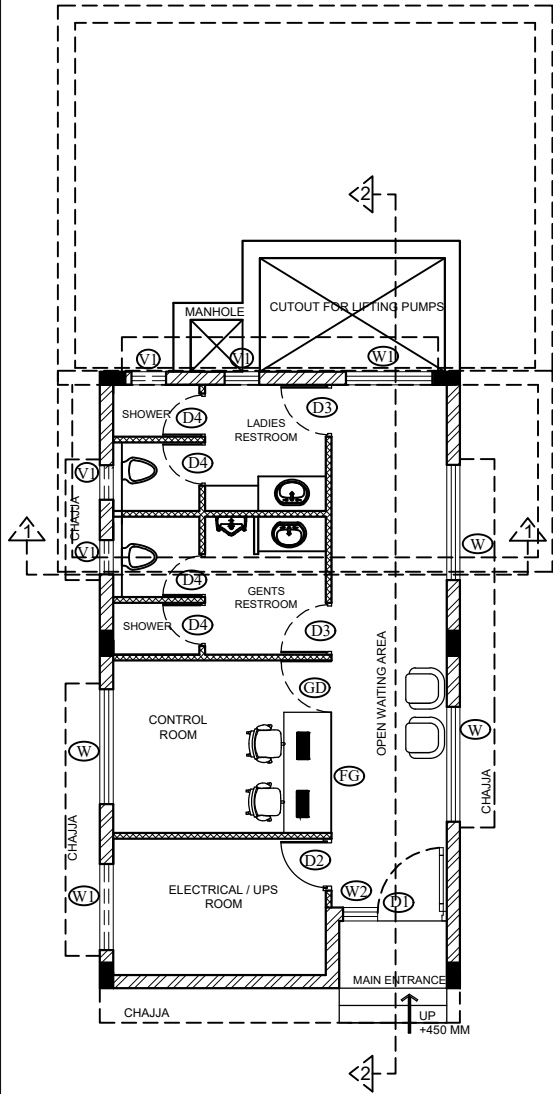
PRJ. NO. PSDI/1617/16	DEALT BY MOKSHA	CHECKED BY SV
	SCALE 1/10	DATE 06.09.2021
	UNITS MM	
	DWG. NO. PSDI/16-12-2019	
	BUILDUP AREA, TEST FACILITY: 1260 SQFT.	
	CONTROL ROOM BUILDING: 730 SQFT	

DRAWING TITLE
 ELEVATION DETAIL OF MAIN BUILDING SHEET 04

CLIENT
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ADDRESS:
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SECTION 1

GENERAL NOTES
 ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
 ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/ STRL CONSULTANT BEFORE EXECUTION.
 ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.
ARCHITECTURAL NOTES
 COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

TYPE	Size	Sill Ht	Lintel Ht	Qty	Description
W	2000 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W1	500 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window
W2	600 x 1950	450	2400	01	Aluminum Powder Coated operable Window
FG	2100 x 1950	450	2400	01	Aluminum Frame Fixed Glass

TYPE	Size	Sill Ht	Lintel Ht	Qty	Description
L1	4000 x 2000	9018	11018	03	METAL LOUVERS
L2	2000 x 2000	9018	11018	01	METAL LOUVERS

TYPE	Size	Sill Ht	Lintel Ht	Qty	Description
V1	600 X 900	1500	2400	04	Aluminum Powder Coated Ventilation

TYPE	Size	Qty	Description
D	1800 x 2400	2400	01 Metal Door (Fire Rated)
D1	1200 x 2400	2400	01 Metal Door (Fire Rated)
D2	900 x 2400	2400	01 Metal Door (Fire Rated)
D3	750 x 2400	2400	02 Metal Door (Fire Rated)
D4	750 x 2400	2400	02 Flush Doors

TYPE	Size	Qty	Description
RS	4000 x 6000	6000	01 Rolling shutter

PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS
ELECTRICAL CONTRACTOR
HWAC CONTRACTOR

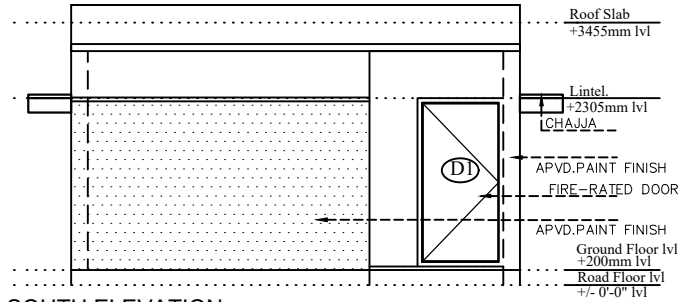
PROPOSAL
STAMP

PRJ. NO.	DEALT BY	CHECKED BY
PDS/1617/16	NIVA	SV
SCALE	NTS	DATE
		16 12 2019
UNITS	MM	
DWG. No.	PDS/16.12.2019	
BUILT UP AREA, TEST FACILITY: 126 SQ.FT. CONTROL ROOM BUILDING: 730 SQ.FT.		

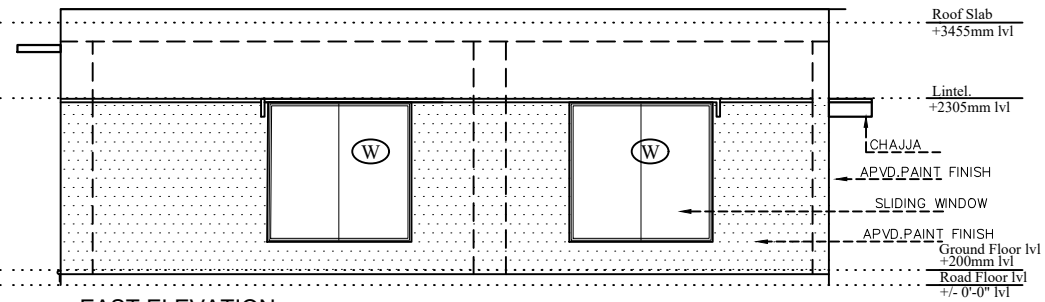
DRAWING TITLE
 CONTROL ROOM PLAN SHEET 05

CLIENT
 M/s IISC
ADDRESS:
 CV Raman Rd, Bengaluru, Karnataka 560015

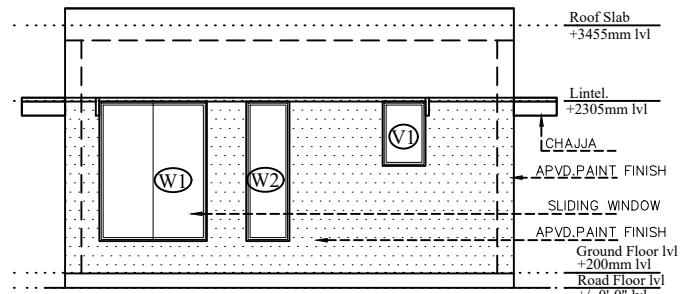
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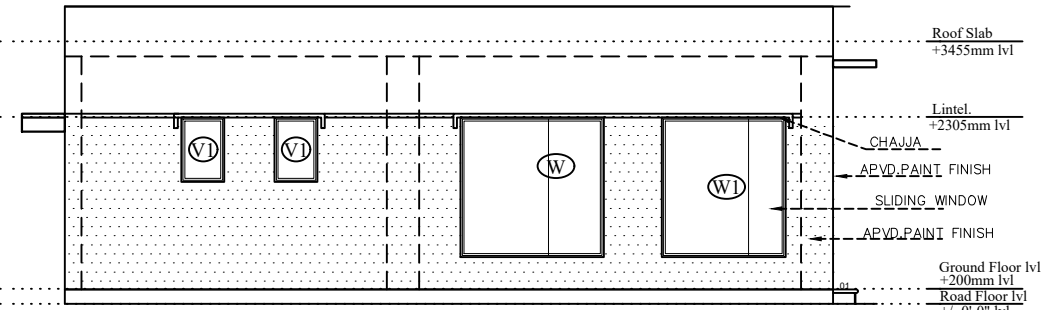
SOUTH ELEVATION



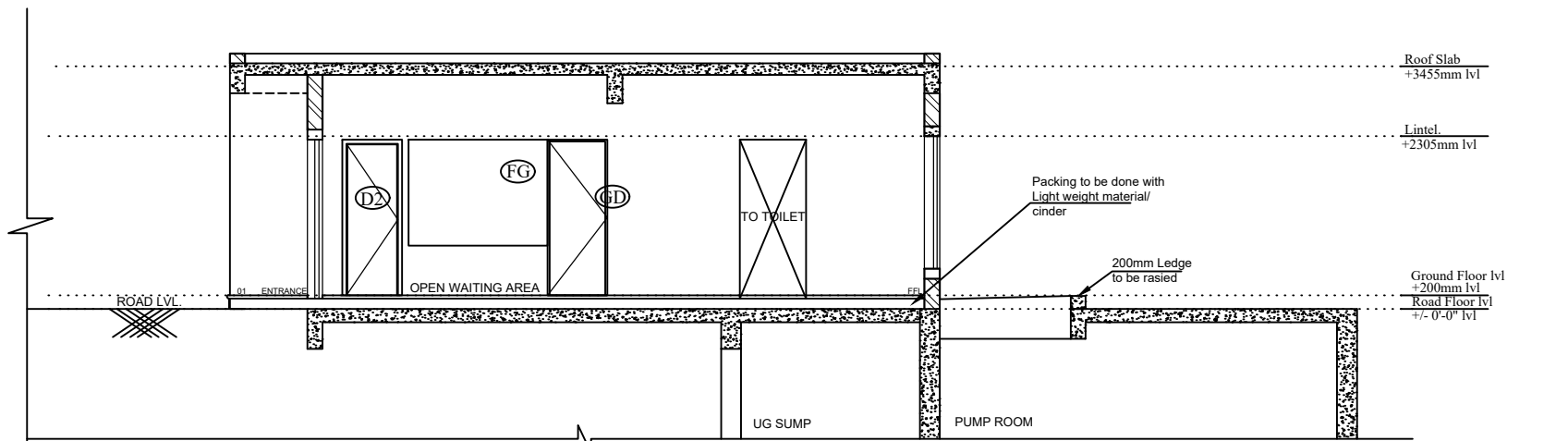
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SECTION 2

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
 ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/ STRL CONSULTANT BEFORE EXECUTION.
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ARCHITECTURAL NOTES

COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
--------	--------	-------------	----------	--------------

REVISIONS

R0	
R1	07-05-2022



PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
-------	--

PRJ. NO. PDS/1617/16	DEALT BY NIVA	CHECKED BY SV
	SCALE NTS	DATE 16.12.2019
	UNITS MM	
	DWG No PDS/16.12.2019	
	BUILT UP AREA, TEST FACILITY: 126 SQFT. CONTROL ROOM BUILDING: 730 SQFT.	

DRAWING TITLE

CONTROL PLAN DETAILS SHEET 06

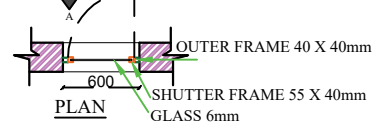
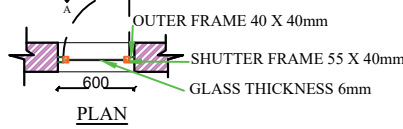
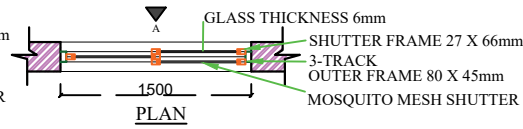
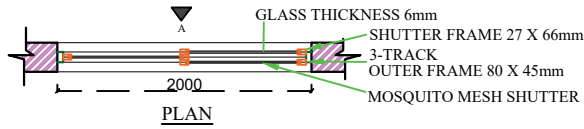
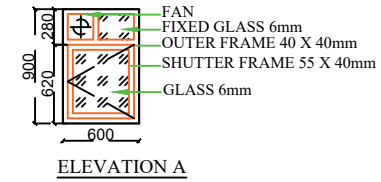
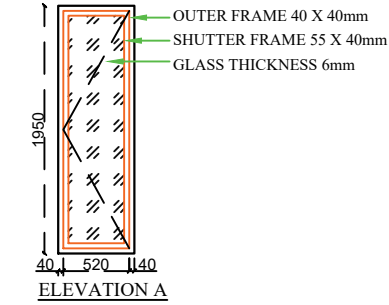
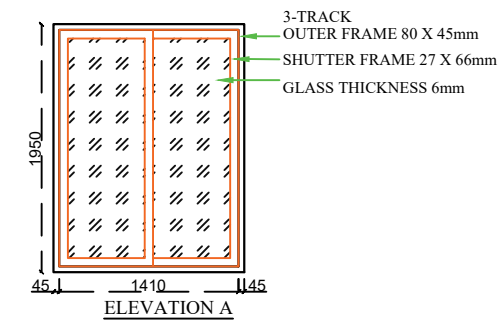
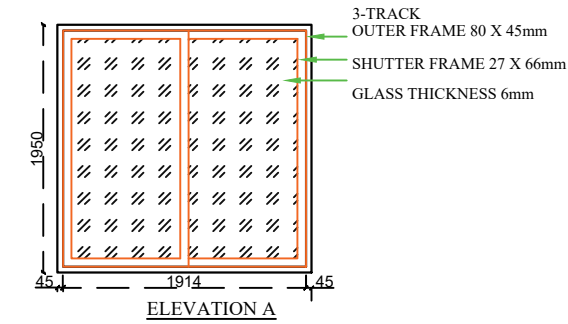
CLIENT

M/s IISC

ADDRESS:

CV Raman Rd, Bengaluru, Karnataka 560075

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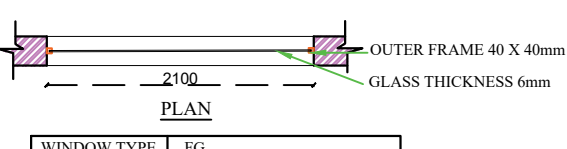
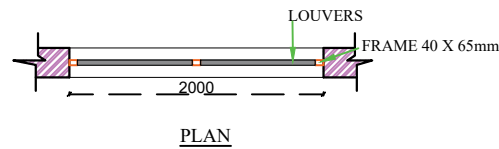
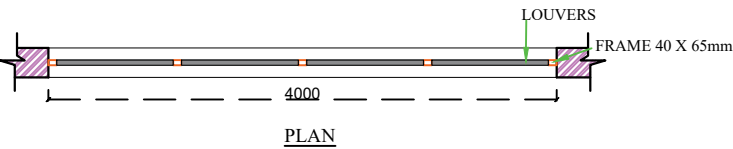
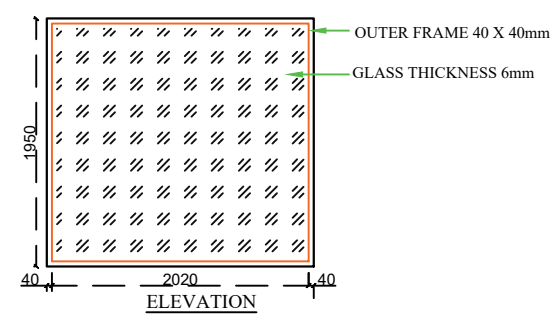
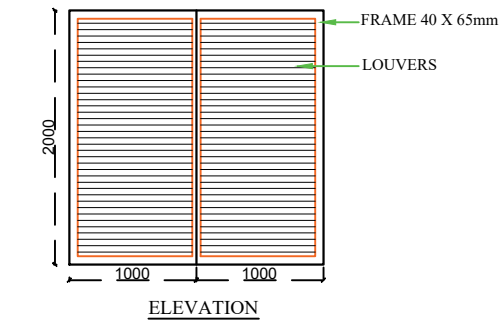
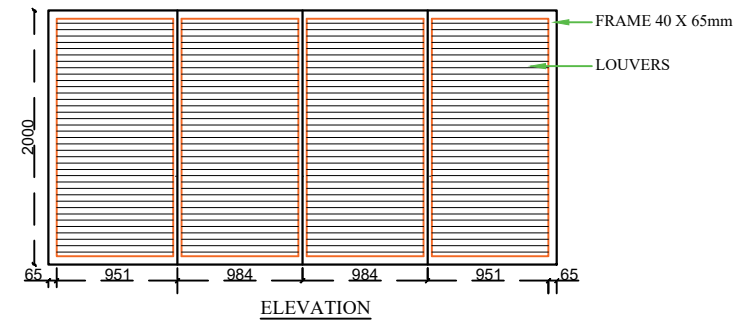


WINDOW TYPE	W
SIZE	2000 X 1950 mm
QUANTITY	3
DESCRIPTION	ALUMINUM POWDER COATED SLIDING WINDOW

WINDOW TYPE	W1
SIZE	1500 X 1950 mm
QUANTITY	3
DESCRIPTION	ALUMINUM POWDER COATED SLIDING WINDOW

WINDOW TYPE	W2
SIZE	600 X 1950 mm
QUANTITY	1
DESCRIPTION	ALUMINUM POWDER COATED OPENABLE WINDOW

WINDOW TYPE	V1
SIZE	600 X 900 mm
QUANTITY	4
DESCRIPTION	ALUMINUM POWDER COATED VENTILATOR



WINDOW TYPE	L1
SIZE	4000 X 2000 mm
QUANTITY	3
DESCRIPTION	METAL LOUVERS

WINDOW TYPE	L2
SIZE	2000 X 2000 mm
QUANTITY	1
DESCRIPTION	METAL LOUVERS

WINDOW TYPE	FG
SIZE	2100 X 1950 mm
QUANTITY	1
DESCRIPTION	ALUMINUM FRAMED FIXED GLASS

GENERAL NOTES
ALL DIMENSIONS IN FT AND INCHES FOLLOW WITHIN DIMENSIONS.
ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/STRUC. CONSULTANT BEFORE EXECUTION.
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ARCHITECTURAL NOTES
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
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REVISIONS
R0
R1



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094

CONSULTANTS
ELECTRICAL CONTRACTOR
HVAC CONTRACTOR

PROPOSAL
STAMP

PRJ. NO. PDS/161/16	DEALT BY SV	CHECKED BY SV
SCALE NTS	DATE 15.06.2022	
UNITS MM		

BUILT UP AREA: TEST FACILITY: 126 SQFT. CONTROL ROOM BUILDING: 730 SQFT.

DRAWING TITLE
WINDOW DETAIL SHEET

CLIENT
M/s IISC
ADDRESS:
CV Raman Rd, Bengaluru, Karnataka 560075
163
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SQUARE ROD 12mm
GREY ENAMEL PAINT

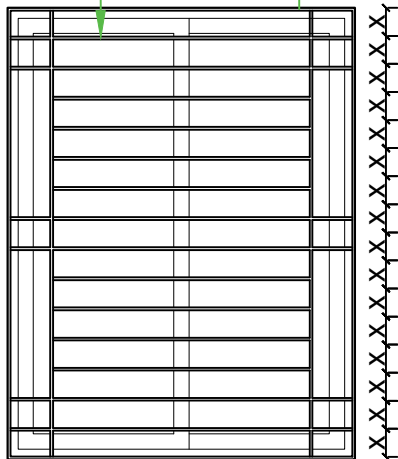
FLAT ROD



196 1608 196

WINDOW TYPE	W
SIZE	2000 X 1950 mm
QUANTITY	3
DESCRIPTION	ALUMINUM POWDER COATED SLIDING WINDOW

SQUARE ROD 12mm FLAT ROD
GREY ENAMEL PAINT

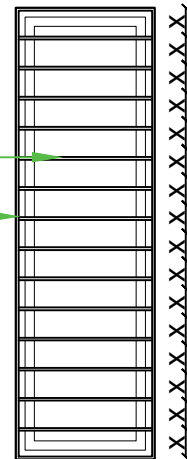


196 1108 196

WINDOW TYPE	W1
SIZE	1500 X 1950 mm
QUANTITY	3
DESCRIPTION	ALUMINUM POWDER COATED SLIDING WINDOW

SQUARE ROD 12mm
GREY ENAMEL PAINT

FLAT ROD



600

WINDOW TYPE	W2
SIZE	600 X 1950 mm
QUANTITY	1
DESCRIPTION	ALUMINUM POWDER COATED OPENABLE WINDOW

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.

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ALL STRUCTURAL DRGS.ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

ARCHITECTURAL NOTES



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE ACES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS

PROPOSAL

STAMP

PRJ. NO./PDS/1617/16

DEALT BY	CHECKED BY
SV	SV
SCALE	NTS
DATE	15 06 2022
UNITS	MM

BUILT-UP AREA: TEST FACILITY-1280 SQFT. CONTROL ROOM BUILDING-730 SQFT.

DRAWING TITLE

GRILL DETAILS

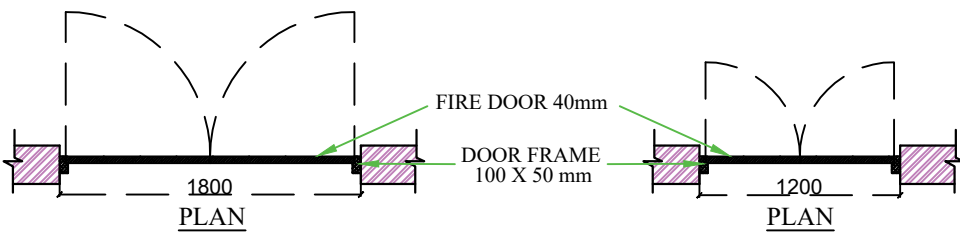
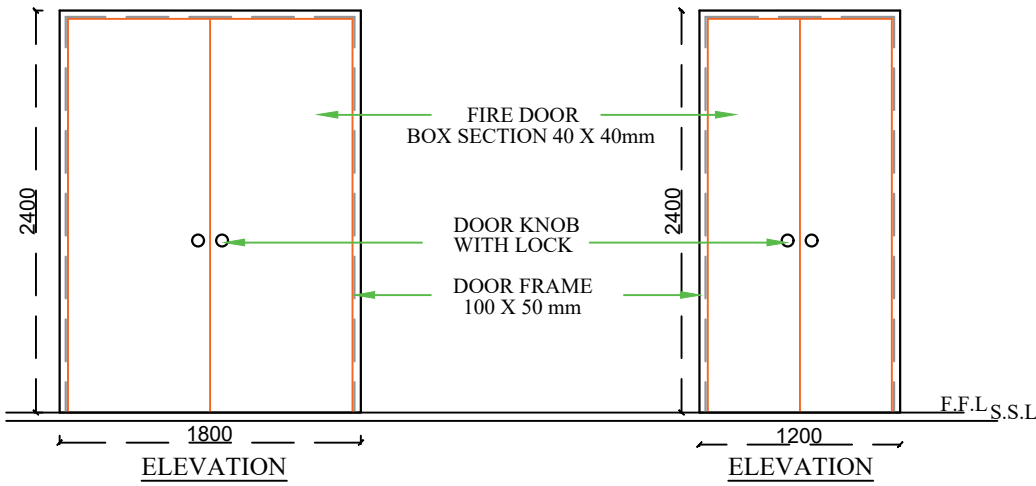
CLIENT

M/s IISC

ADDRESS:

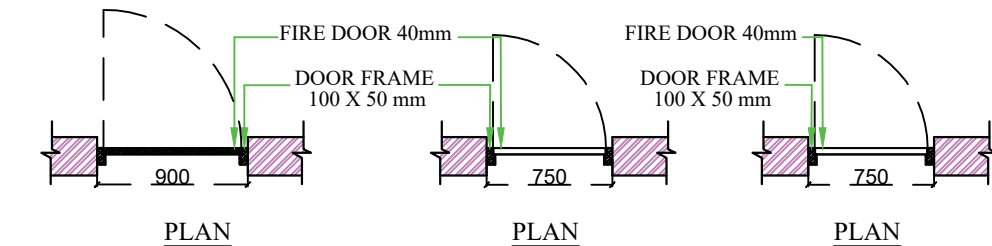
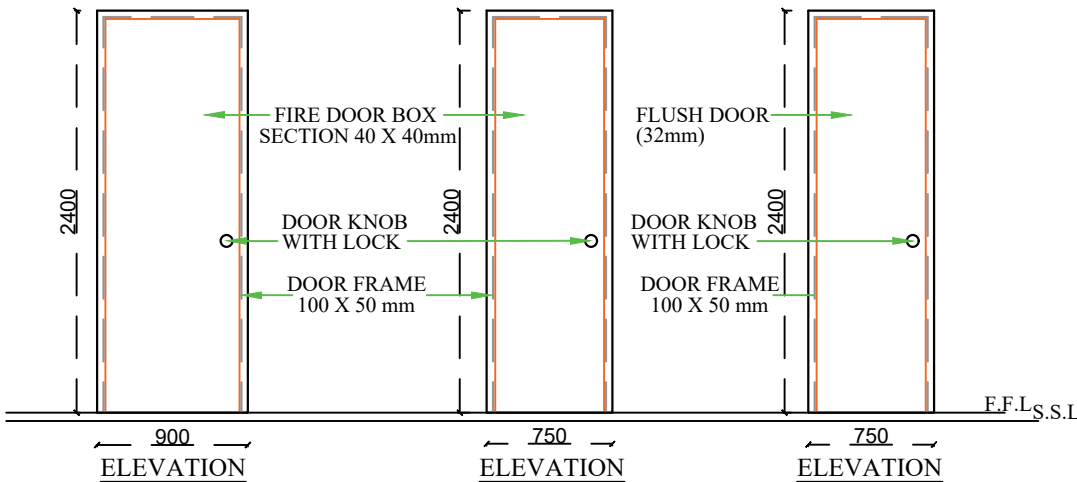
CV Raman Rd, Bengaluru, Karnataka

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DOOR TYPE	D
SIZE	1800 X 2400
QUANTITY	1
DESCRIPTION	METAL DOOR FIRE RATED

DOOR TYPE	D1
SIZE	1200 X 2400
QUANTITY	1
DESCRIPTION	METAL DOOR FIRE RATED



DOOR TYPE	D2
SIZE	900 X 2400
QUANTITY	1
DESCRIPTION	METAL DOOR FIRE RATED

DOOR TYPE	D3
SIZE	750 X 2400
QUANTITY	2
DESCRIPTION	METAL DOOR FIRE RATED

DOOR TYPE	D4
SIZE	750 X 2400
QUANTITY	1
DESCRIPTION	FLUSH DOOR

1. ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
2. ANY DISCREPANCY NOTED IN THE DRG. SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/ STRL CONSULTANT BEFORE EXECUTION.
3. ALL STRUCTURAL DRGS. ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
--------	--------	-------------	----------	--------------

REVISIONS	
H	R0
	R1

DOOR WINDOW SCHEDULE						
WINDOWS:						
Type	Size	Sill ht.	Lintel ht.	Nos.	Description	
W	2000 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window	
W1	1500 x 1950	450	2400	03	Aluminum Powder Coated Sliding Window	
W2	600 x 1950	450	2400	01	Aluminum Powder Coated openable Window	
FG	2100 x 1950	450	2400	01	Aluminum Frame Fixed Glass	

LOUVERS						
Type	Size	Cill ht.	Lintel ht.	Nos.	Description	
L1	4000 x 2000	9018	11018	03	METAL LOUVERS	
L2	2000 x 2000	9018	11018	01	METAL LOUVERS	

VENTILATORS						
Type	Size	Cill ht.	Lintel ht.	Nos.	Description	
V1	600 x 900	1500	2400	04	Aluminum Powder Coated Ventilator	

DOORS:				
Type	Size	Lintel ht.	Nos.	Description
D	1800 x 2400	2400	01	Metal Door (Fire Rated)
D1	1200 x 2400	2400	01	Metal Door (Fire Rated)
D2	900 x 2400	2400	01	Metal Door (Fire Rated)
D3	750 x 2400	2400	02	Metal Door (Fire Rated)
D4	750 x 2400	2400	02	Flush Doors

DOOR and WINDOWS:				
Type	Size	Lintel ht.	Nos.	Description
RS	4000 x 6000	6000	01	Rolling shutter

ARCHITECTS



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE ACES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS

STRUCTURAL	
ELECTRICAL & PHE	
SERVICE CONTRACTORS	
HVAC CONTRACTOR	
ELECTRICAL CONTRACTOR	
PLUMBING CONTRACTOR	

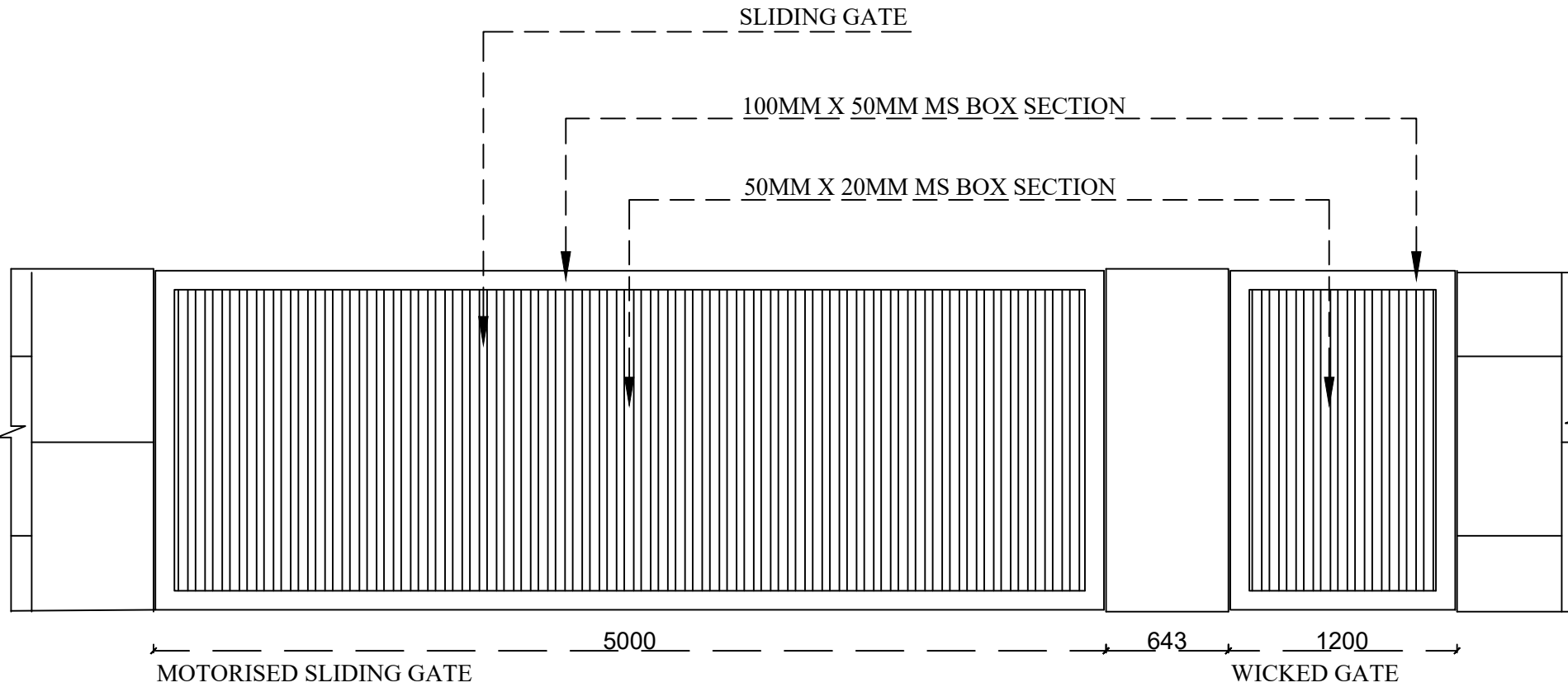
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DEALT BY	CHECKED BY		
SV	SV		
SCALE	NTS	DATE	16/06/2022
DWG. No.			
BUILT-UP			
UNITS: MM			

DRAWING TITLE	
DOOR DETAIL	REVISION
	N

CLIENT	M/s IISC
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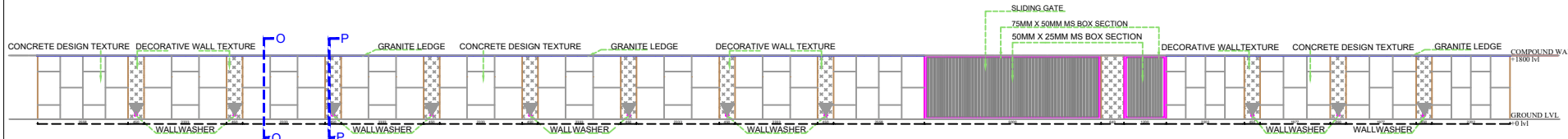
ADDRESS	CV Raman Rd, Bengaluru, Karnataka
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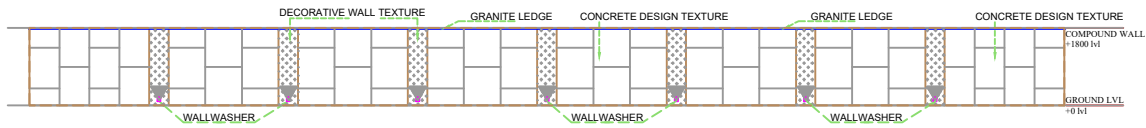


ELEVATION

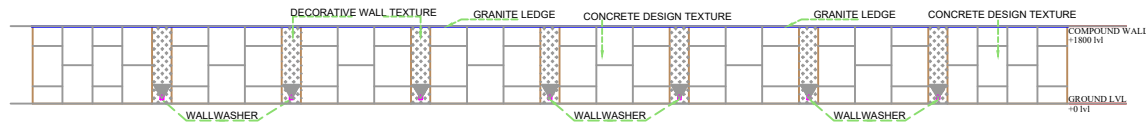
GENERAL NOTES																
ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.																
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ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.																
ARCHITECTURAL NOTES																
SCHEME TENDER INFORMATION APPROVAL CONSTRUCTION																
REVISIONS																
R0																
<p>PRISTINE DESIGN STUDIO ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094</p>																
CONSULTANTS																
ELECTRICAL CONTRACTOR																
HVAC CONTRACTOR																
PROPOSAL																
STAMP																
<table border="1"> <tr> <td>PRJ. NO. PDS/1617/16</td> <td>DEALT BY</td> <td>CHECKED BY</td> </tr> <tr> <td></td> <td>SV</td> <td></td> </tr> <tr> <td>SCALE</td> <td>NTS</td> <td>DATE 16.06.2022</td> </tr> <tr> <td>UNITS</td> <td>MM</td> <td></td> </tr> </table>					PRJ. NO. PDS/1617/16	DEALT BY	CHECKED BY		SV		SCALE	NTS	DATE 16.06.2022	UNITS	MM	
PRJ. NO. PDS/1617/16	DEALT BY	CHECKED BY														
	SV															
SCALE	NTS	DATE 16.06.2022														
UNITS	MM															
DRAWING TITLE																
MOTORISED SLIDING GATE																
CLIENT																
M/s IISC																
ADDRESS:																
CV Raman Rd, Bengaluru, Karnataka 560075																
<small>This drawing is proprietary property and shall not be copied or used without written permission of Pristine Design Studio, Bangalore.</small>																



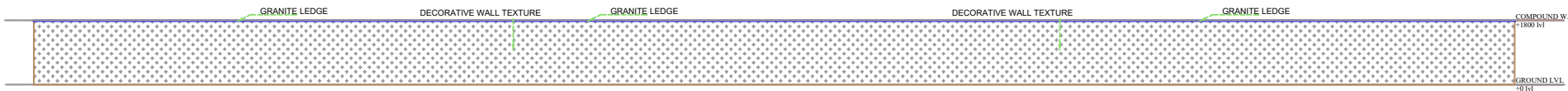
Compound wall front elevation A



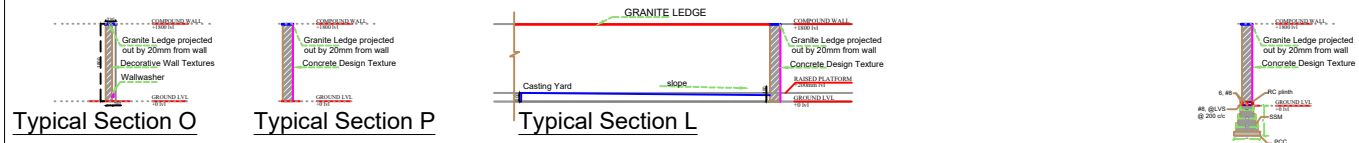
Compound wall side elevation B



Compound wall side elevation D



Compound wall elevation C

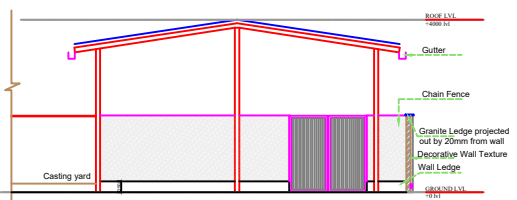


Typical Section O

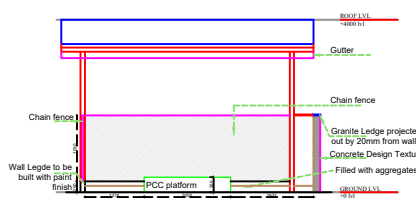
Typical Section P

Typical Section L

Typical Section P

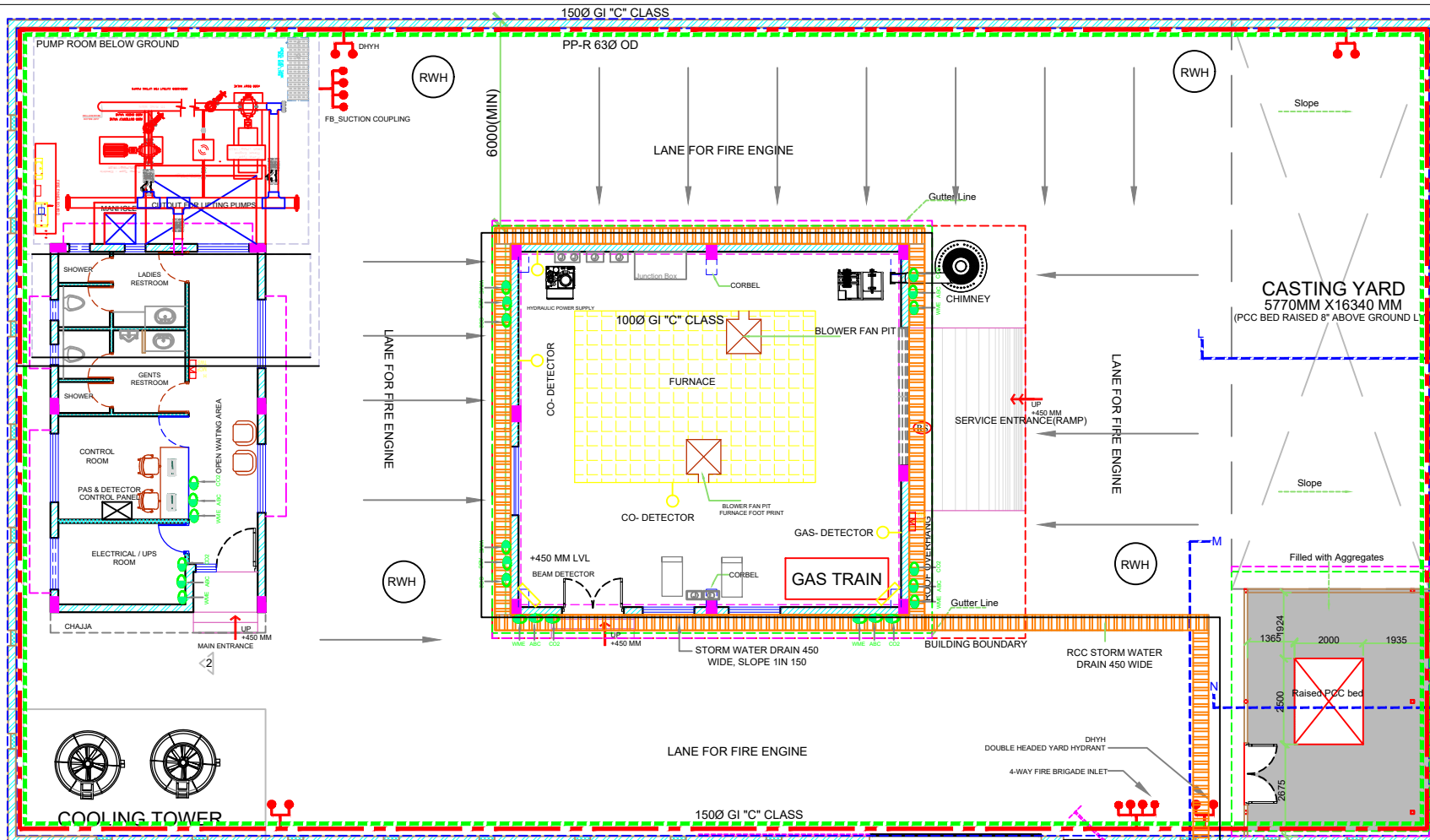


Sectional elevation M



Sectional elevation N

GENERAL NOTES				
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ARCHITECTURAL NOTES				
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE				
SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
REVISIONS				
R0				
R1				
<ul style="list-style-type: none"> 9" BRICK WALL 9" BRICK WALL DECORATIVE WALL TEXTURE CHAIN FENCE CONCRETE DESIGN TEXTURE 				
PRISTINE DESIGN STUDIO				
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RM 2ND STAGE BANGALORE-560094				
CONSULTANTS				
ELECTRICAL CONTRACTOR				
HVAC CONTRACTOR				
PROPOSAL				
STAMP				
PRJ. NO.: PDS/1817/16				
DEALT BY		CHECKED BY		
NIVA		SV		
SCALE		DATE		
NTS		16.12.2019		
UNITS: I/M				
DWS No: PDS/16.12.2019				
BUILT UP AREA: TEST FACILITY: 1260 SQFT. CONTROL ROOM BUILDING: 730 SQFT.				
DRAWING TITLE				
SITE PLAN				
SHEET 01				
CLIENT				
M/s IISC				
ADDRESS:				
CV Raman Rd, Bengaluru, Karnataka 560075				
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GENERAL NOTES
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 COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	DESCRIPTION	DATE
R0		
R1		07-05-2022

SL NO	SYMBOL	DESCRIPTION	QTY	MAKE	MODEL

PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE - 560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
-------	--

PRJ. NO. PDS/1617/16	DEALT BY RAO	CHECKED BY RAO
	SCALE 1: 60	DATE 16 12 2019
	UNITS: MM	
	DWG. NO. PDS/16.12.2019	
	BUILT UP AREA, TEST FACILITY: 126 SQFT. CONTROL ROOM BUILDING: 730 SQFT.	

DRAWING TITLE
 SITE PLAN
 FIRE FIGHTING SERVICES

CLIENT
 M/s IISC
 ADDRESS:
 CV Raman Rd, Bengaluru, Karnataka
 560016

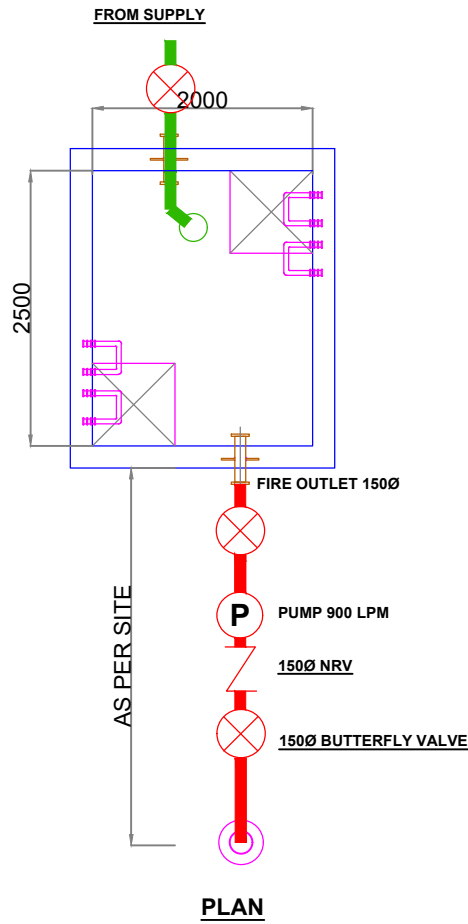
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COMPOUND WALL

LEGEND			
SL NO	ITEM DESCRIPTION FOR FIRE FIGHTING SYSTEM		
1	- S	SIDE THROW SPRINKLERS	0
2	- MCP	MANUAL CALL POINT	4
3	- H	HOOTER	4
4	- PAS	PUBLIC ADDRESS SYSTEM	4
5		ABC EXTINGUISHERS- 6 KG	8
6		CO2 EXTINGUISHERS	8
7		WATER MIST FIRE EXTINGUISHER 4 LTR	8
8		CO/GAS DETECTORS	8
9		SMOKE DETECTORS	8
10		BEAM DETECTORS	2

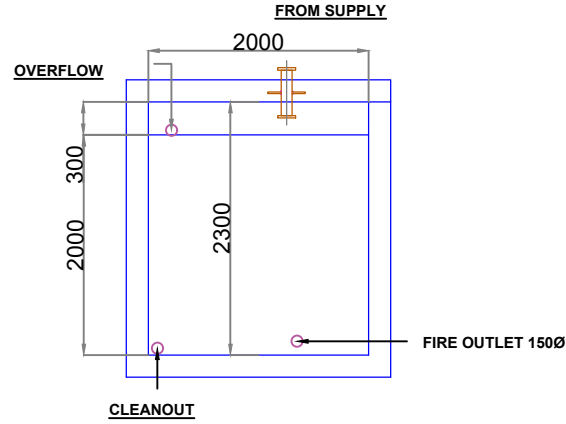
MAIN ENTRANCE GATE WICKET GATE

ROAD

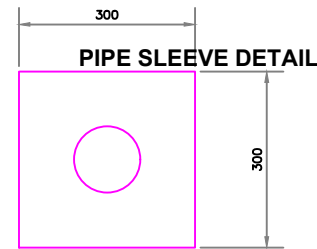
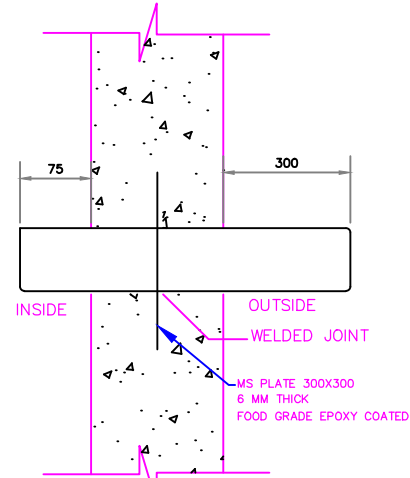


FIRE OVERHEAD TANK

10 KL



SECTION



MS PLATE 300X300
6 MM THICK
FOOD GRADE EPOXY COATED
PUDDLE FLANGE DETAILS
FOR PIPES OF 250 & 300 MM DIA
PLATE SIZE SHALL BE 450 MM X 450 MM

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.
ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/STRUC. CONSULTANT BEFORE EXECUTION.
ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

ARCHITECTURAL NOTES

COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	REVISIONS
R0	
R1	



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 184, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO.	DEALT BY	CHECKED BY
POS/1817/18	MOKSHA	SV
	SCALE	DATE
	UNITS	
DWG NO: POS/18.11.2018		
SUPER BUILT UP AREA-179 SQM 1917 SFT		

DRAWING TITLE

UG TANK & UG PUMP ROOM REINFORCEMENT DETAILS

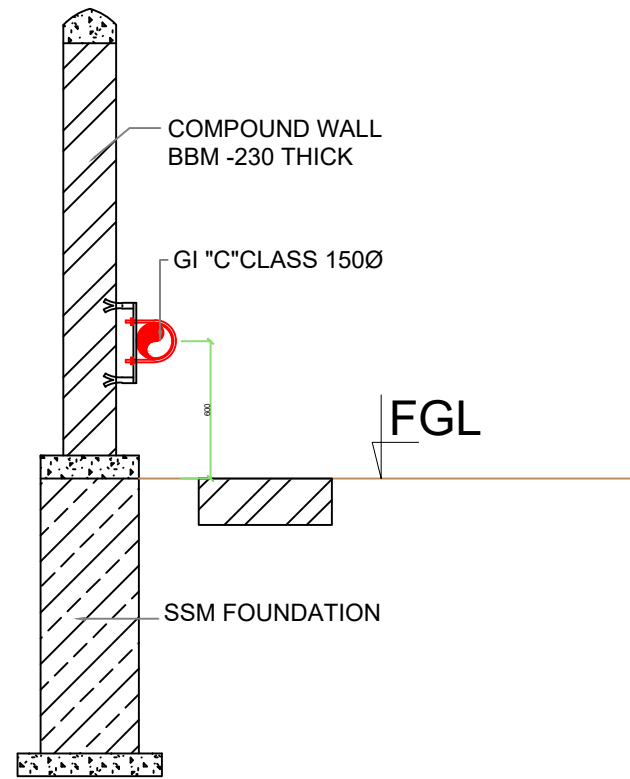
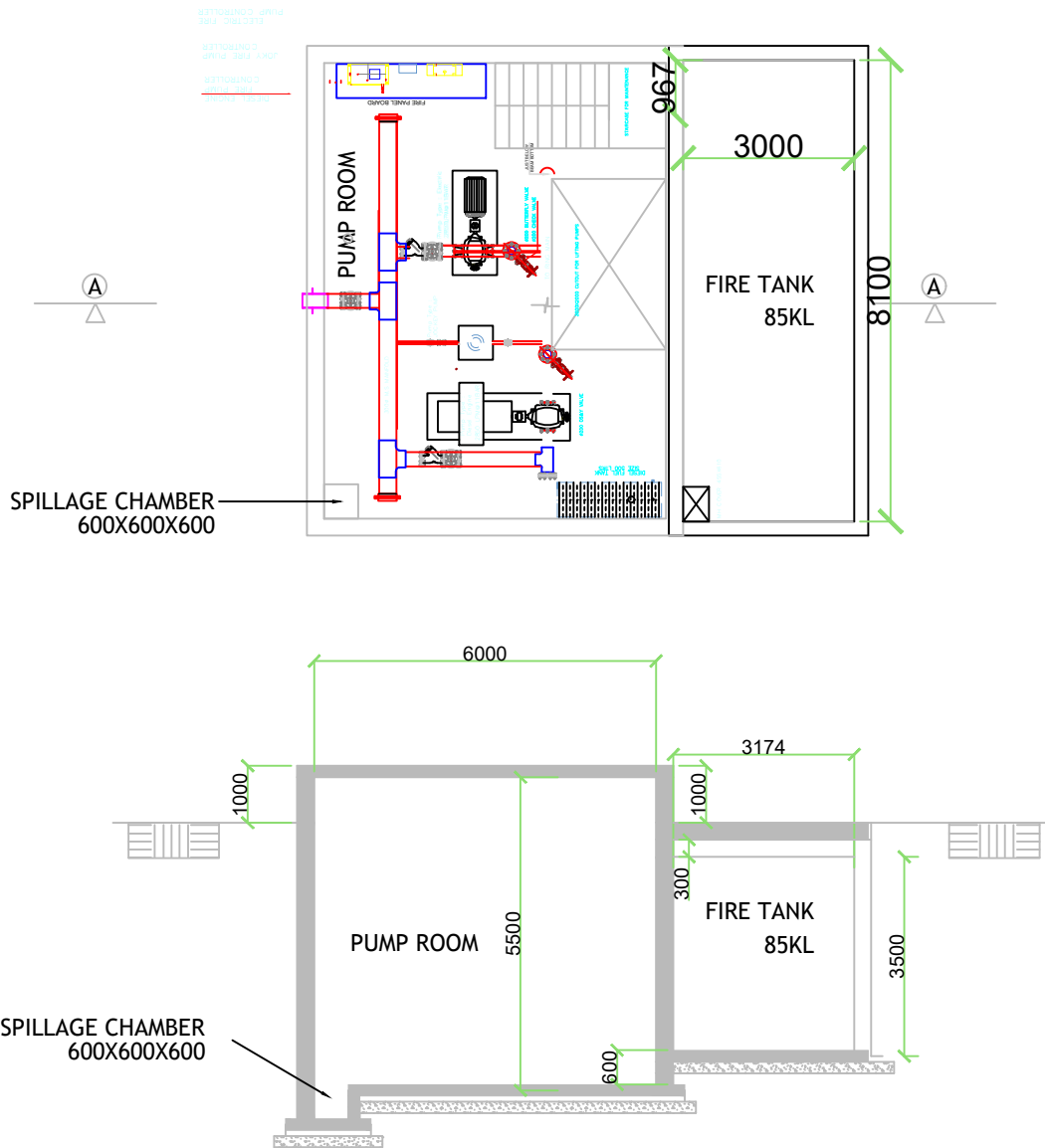
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M/s IISC

ADDRESS:

169

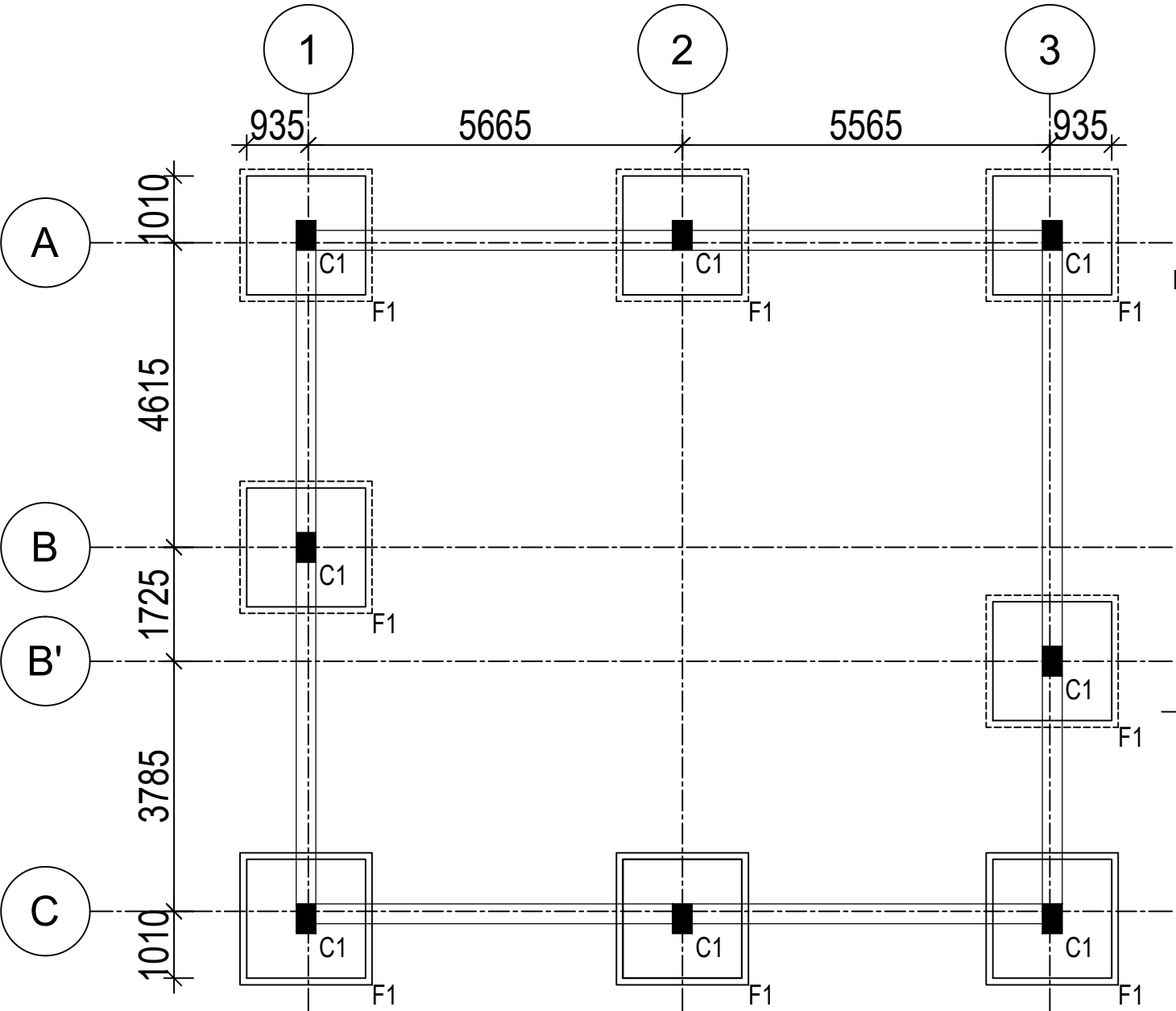
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UNDERGROUND FIRE TANK 650 KL , DEPTH 3+.5M FREE BOARD

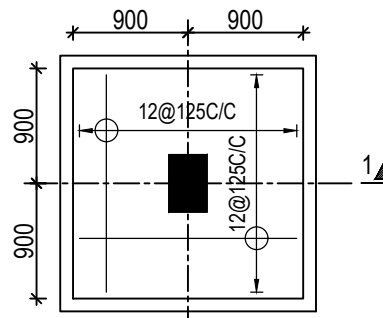
SECTION A-A

GENERAL NOTES				
ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.				
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ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.				
ARCHITECTURAL NOTES				
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE				
SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
REVISIONS				
R0				
R1				
PRISTINE DESIGN STUDIO				
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RV 2ND STAGE BANGALORE-560094				
CONSULTANTS				
ELECTRICAL CONTRACTOR				
HVAC CONTRACTOR				
PROPOSAL				
STAMP				
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DEALT BY		CHECKED BY		
MOKSHA		SV		
SCALE		DATE		
NYS		12.05.2021		
UNITS		MM		
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SUPER BUILT UP AREA-179 SQM 1917 SFT				
DRAWING TITLE				
UG TANK & UG PUMP ROOM				
CLIENT				
M/s IISC				
ADDRESS:				
170				
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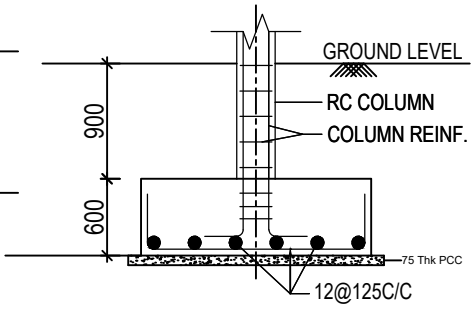


STRONG FLOOR AREA COLUMN, AND FOOTING LAYOUT

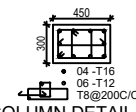
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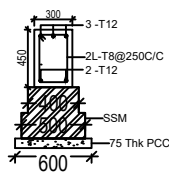
PLAN OF FOOTING (F1)
(SCALE 1:50)



SECTION 1-1
(SCALE 1:50)



COLUMN DETAIL (C1)
(SCALE 1:25)



PLINTH DETAIL (PB)
(SCALE 1:25)

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS:
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ARCHITECTURAL NOTES

COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	DESCRIPTION
R0	
R1	



PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/1817/16	DEALT BY PRAKASH	CHECKED BY SV
	SCALE N/S	DATE 26.09.2022
	UNITS MM	
	DWG. NO. PDS/16.11.2018	
	SUPER BUILT UP AREA-179 SQM	1917 SFT

DRAWING TITLE

FURNACE ROOM FOUNDATION DETAIL

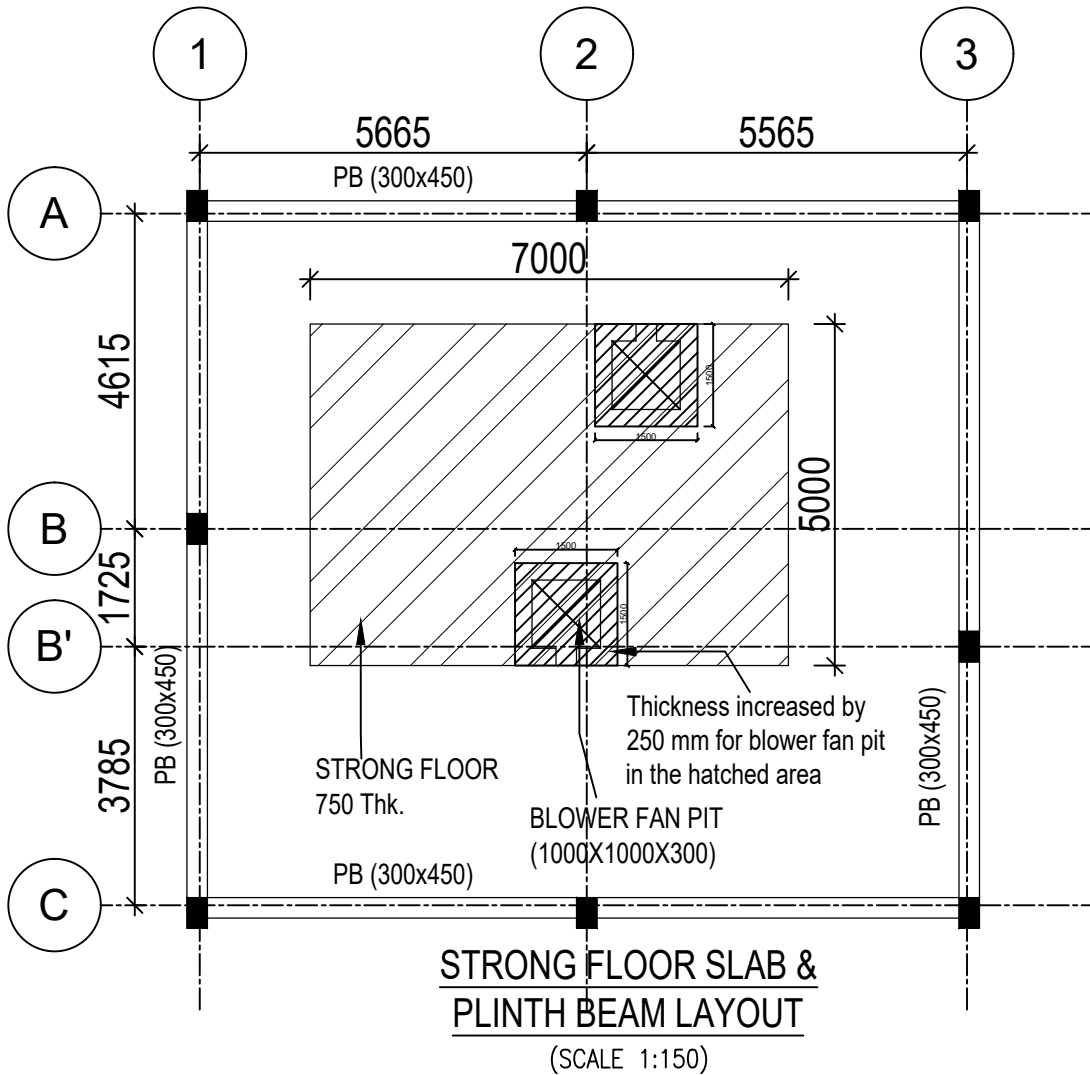
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M/s IISC

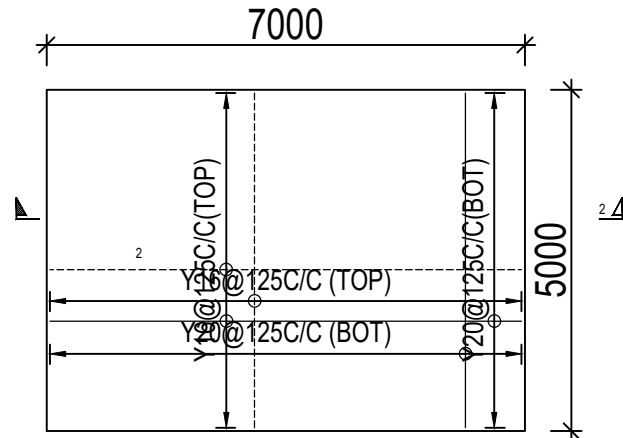
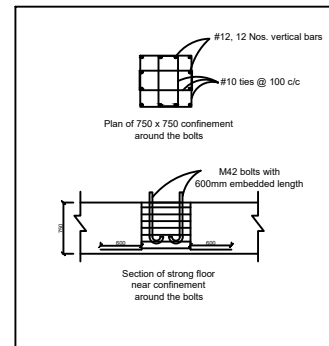
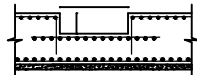
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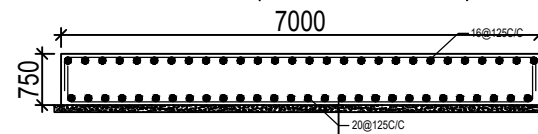


**BLOWER FAN PIT
DETAILS**
(SCALE 1:100)



**STRONG FLOOR RC
DETAILS**

(SCALE 1:100)



SECTION 2-2

(SCALE 1:100)

GENERAL NOTES
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ARCHITECTURAL NOTES
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	DESCRIPTION
R0	
R1	



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/161/16	DEALT BY PRAKASH	CHECKED BY SV
	SCALE 1/5	DATE 26.09.2022
	UNITS MM	
	DWS NO. PDS/16.11.2018 SUPER BUILT UP AREA-179 SQM 1917 SFT	

DRAWING TITLE

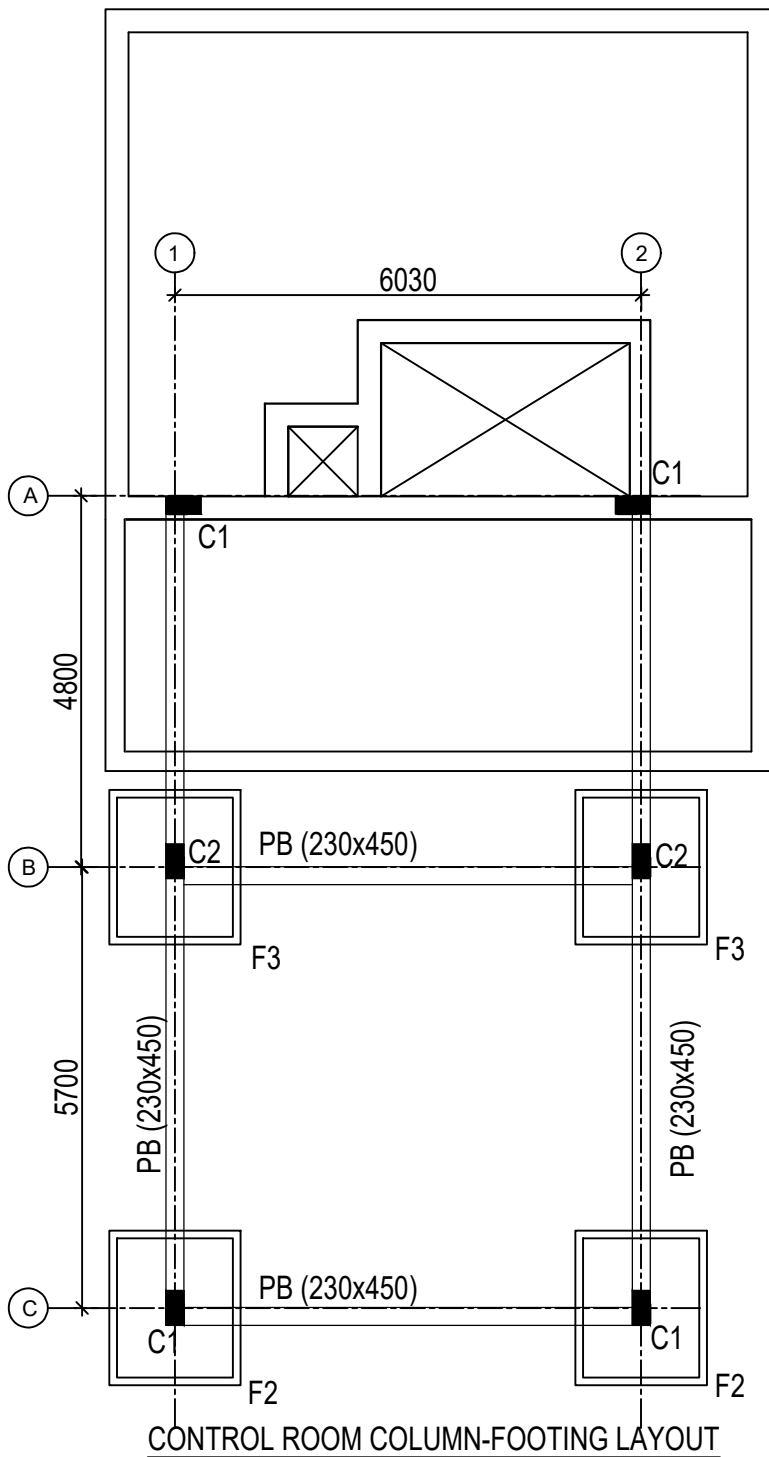
FURNACE ROOM STRONG FLOOR DETAIL	
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CLIENT

M/s IISC
ADDRESS:

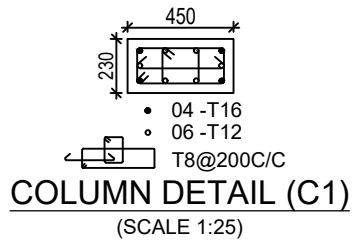
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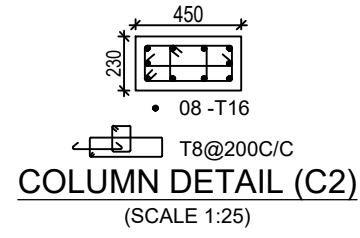
CONTROL ROOM COLUMN-FOOTING LAYOUT

(SCALE 1:150)



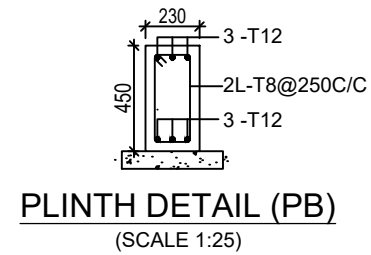
COLUMN DETAIL (C1)

(SCALE 1:25)



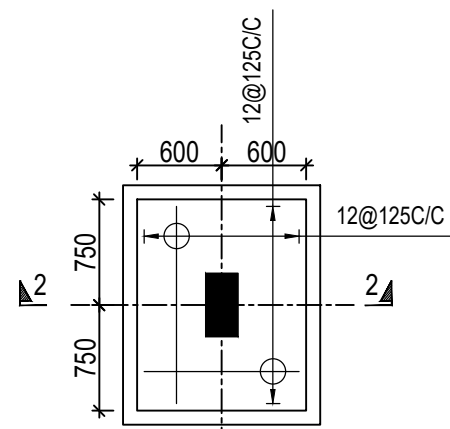
COLUMN DETAIL (C2)

(SCALE 1:25)



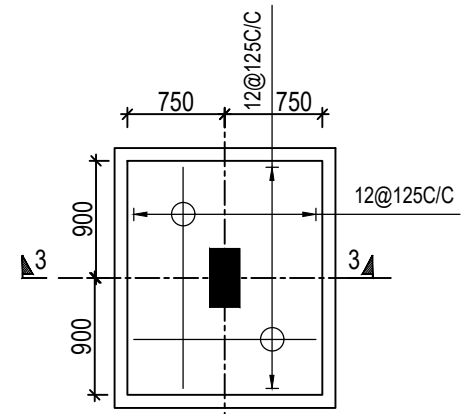
PLINTH DETAIL (PB)

(SCALE 1:25)



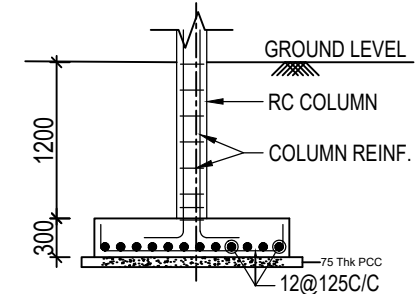
PLAN OF FOOTING (F2)

(SCALE 1:50)



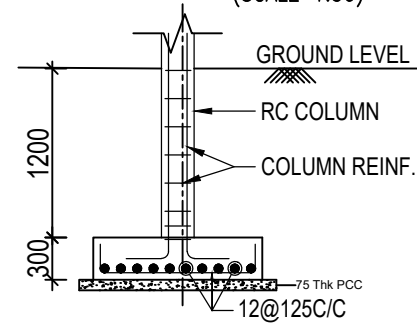
PLAN OF FOOTING (F3)

(SCALE 1:50)



SECTION 3-3

(SCALE 1:50)



SECTION 2-2

(SCALE 1:50)

CONTROL ROOM COLUMN-FOOTING & PLINTH BEAM DETAILS

(SCALE 1:150)

GENERAL NOTES

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ARCHITECTURAL NOTES

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SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

NO	REVISIONS
R0	
R1	



PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/1617/16	DEALT BY PRAKASH	CHECKED BY SV
	SCALE N/S	DATE 26.09.2022
	UNITS MM	
	DWS No. PDS/16.11.2018 SUPER BUILT UP AREA-179 SQM 1917 SFT	

DRAWING TITLE

CONTROL ROOM COLUMN FOOTING DETAILS

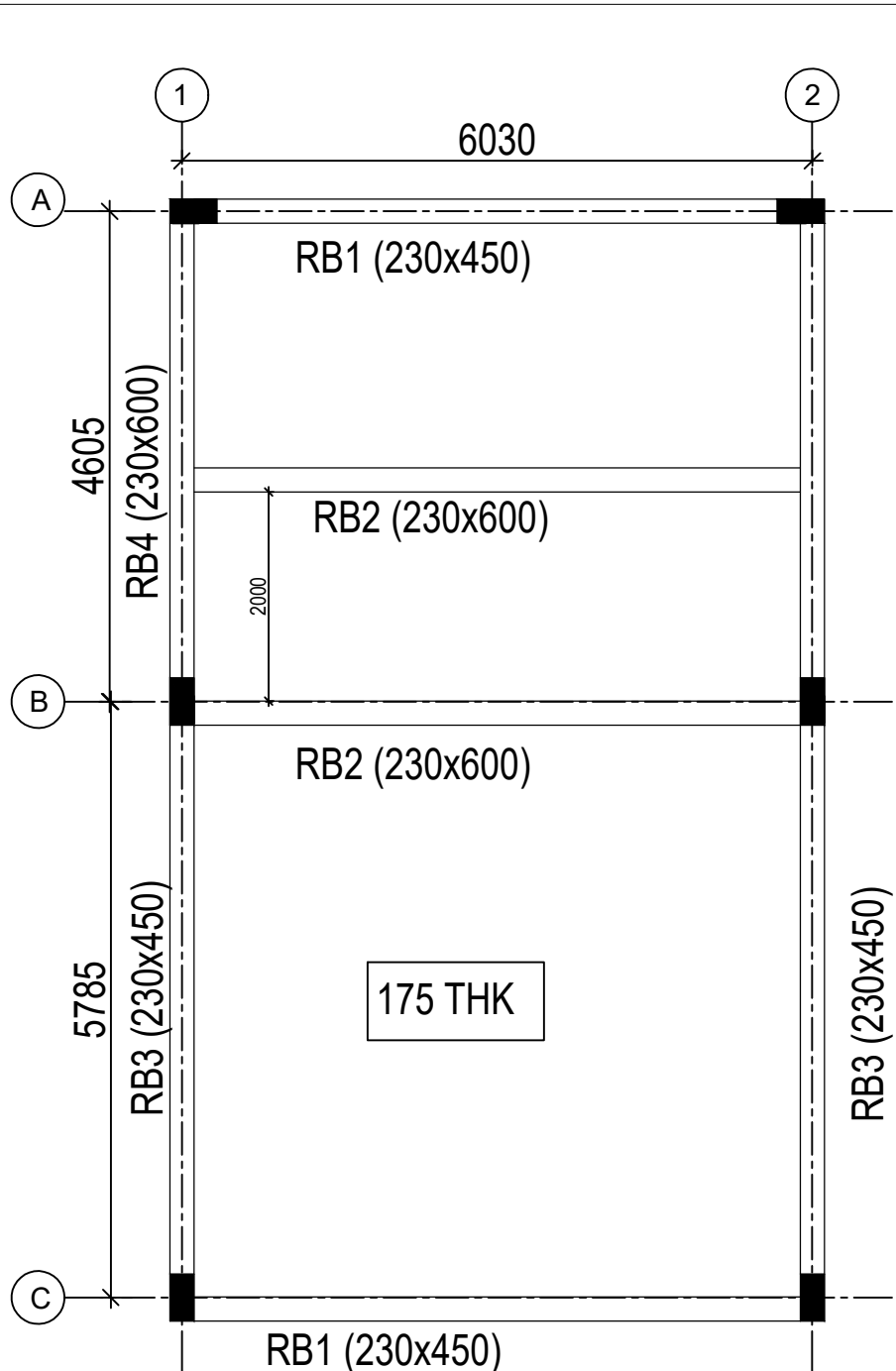
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M/s IISC

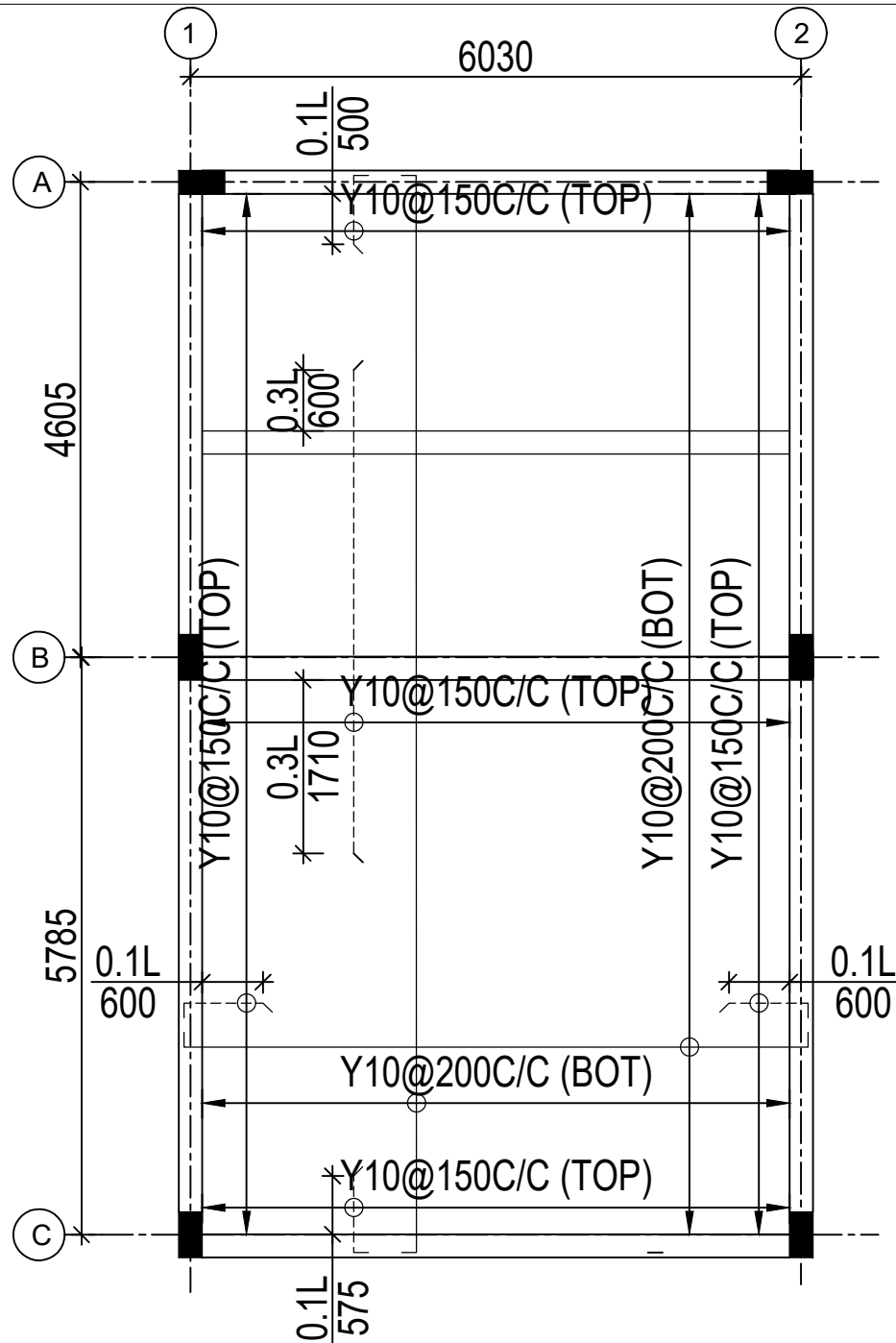
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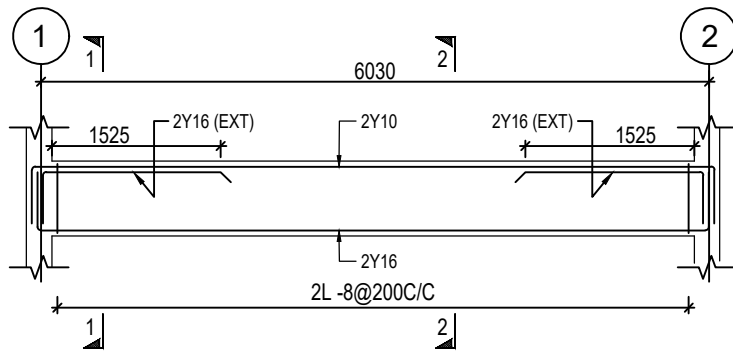


CONTROL ROOM ROOF LAYOUT (SCALE 1:150)

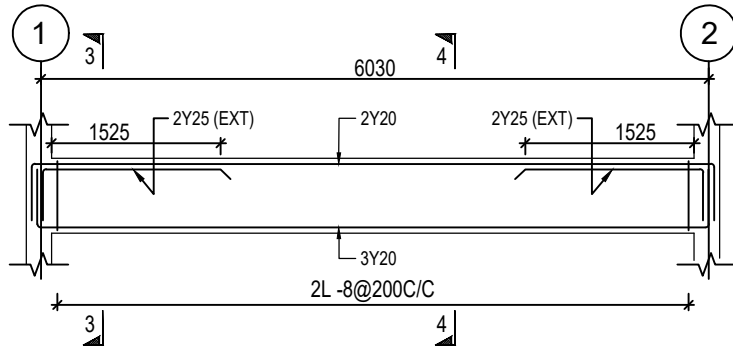
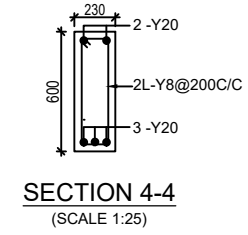
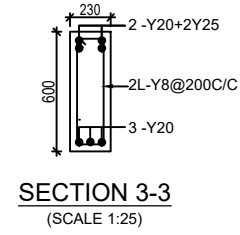
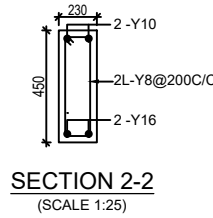
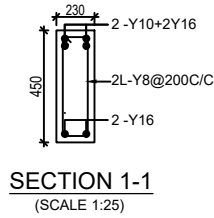


CONTROL ROOM ROOF SLAB REINFORCEMENT DETAILS (SCALE 1:100)

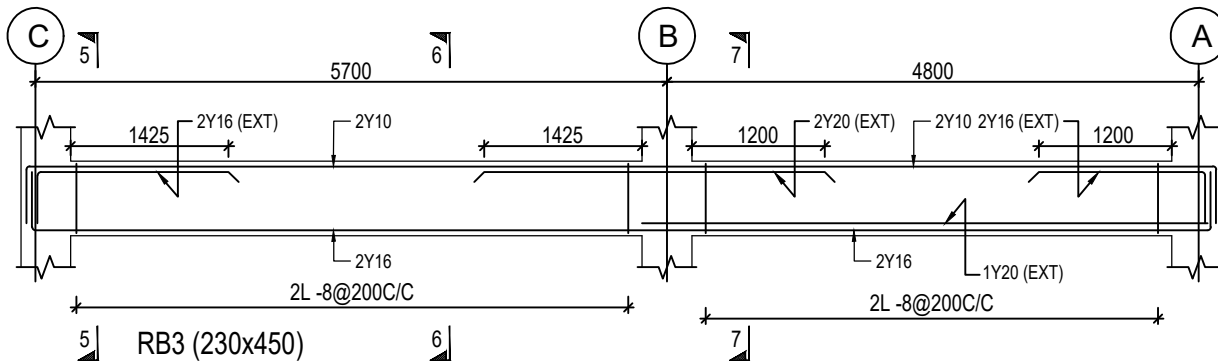
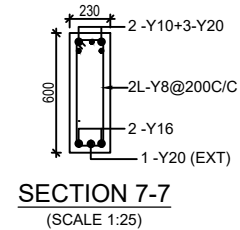
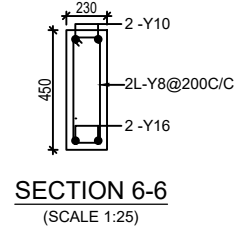
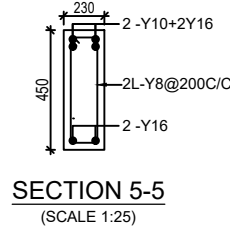
GENERAL NOTES			
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ARCHITECTURAL NOTES			
COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE			
SCHEME	TENDER	INFORMATION	APPROVAL
REVISIONS			
R0			
R1			
CONSULTANTS			
ELECTRICAL CONTRACTOR			
HVAC CONTRACTOR			
PROPOSAL			
STAMP			
PRJ. NO. PDS/1817/18			
DEALT BY	CHECKED BY		
PRAKASH	SV		
SCALE	NTS	DATE	26 09 2022
UNITS	MM		
DWS No. PDS/18.11.2018			
SUPER BUILT UP AREA-179 SQM 1917 SFT			
DRAWING TITLE			
CONTROL ROOM COLUMN FOOTING & ROOF DETAILS			
CLIENT			
M/s IISC			
ADDRESS:			
175			
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RB1 (230x450)



RB2 (230x600)



RB3 (230x450)

GENERAL NOTES
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SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

ARCHITECTURAL NOTES
 COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

REVISIONS	
R0	
R1	



PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS	
ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL	
STAMP	

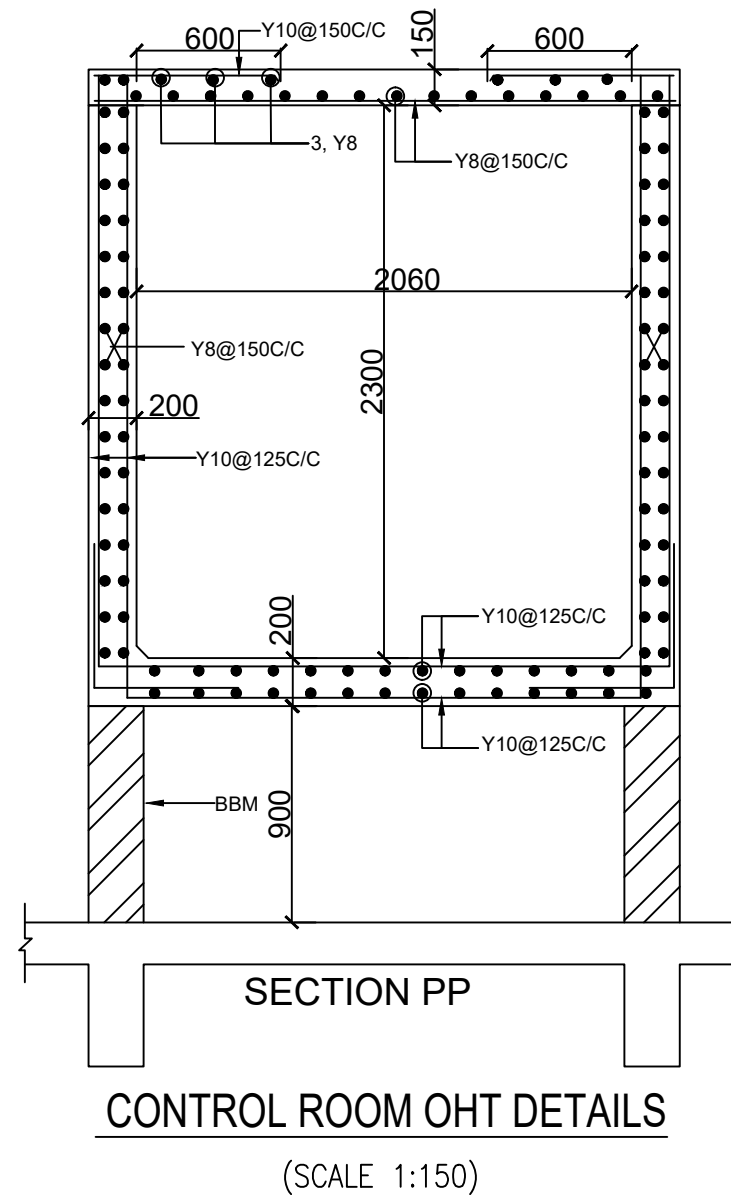
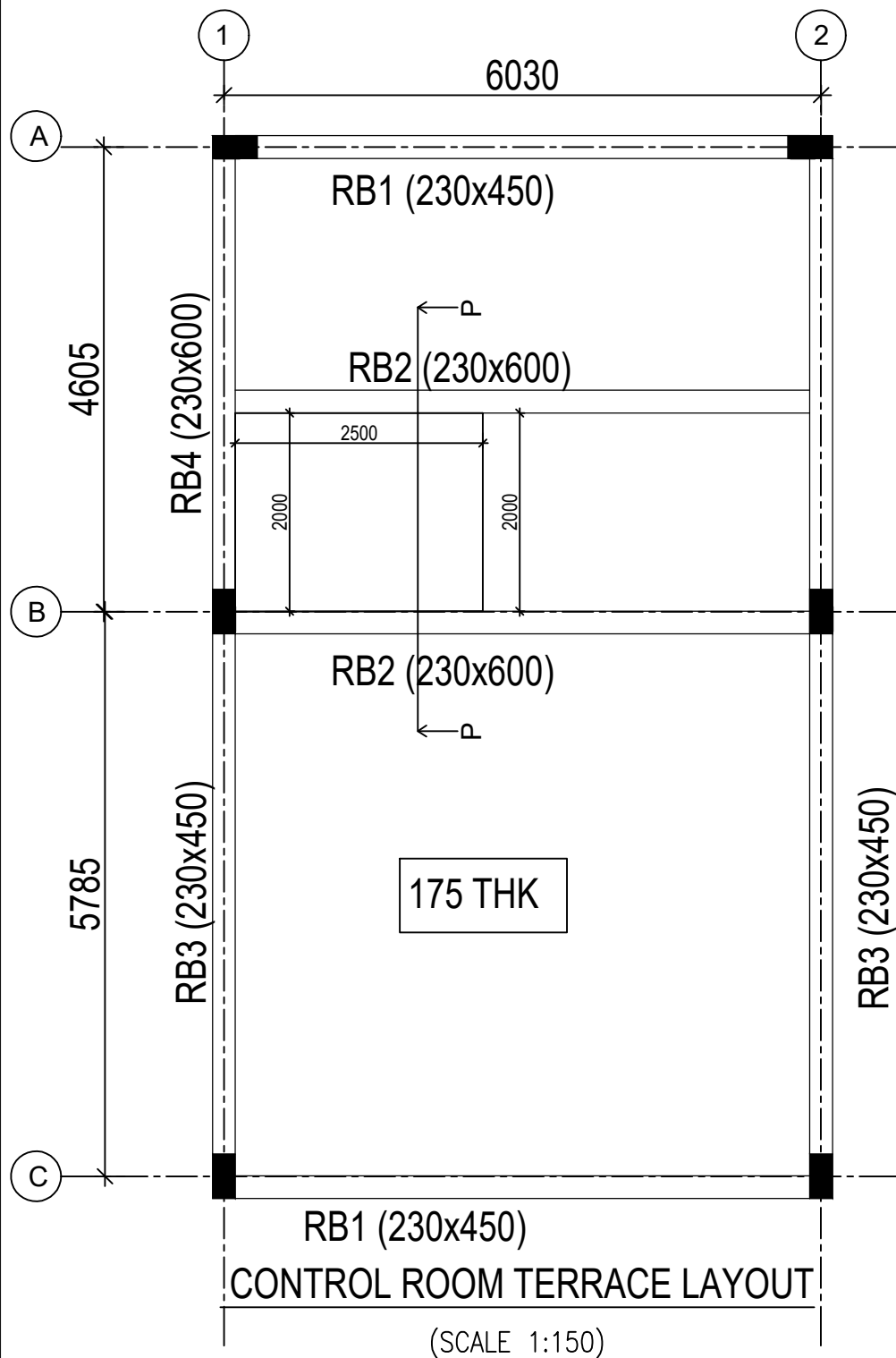
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DEALT BY	PRAKASH	CHECKED BY
SCALE	NYS	DATE
UNITS	MM	
DWS No. PDS/16-11-2018		
SUPER BUILT UP AREA-179 SQM 1917 SFT		

DRAWING TITLE
CONTROL ROOM BEAM DETAIL

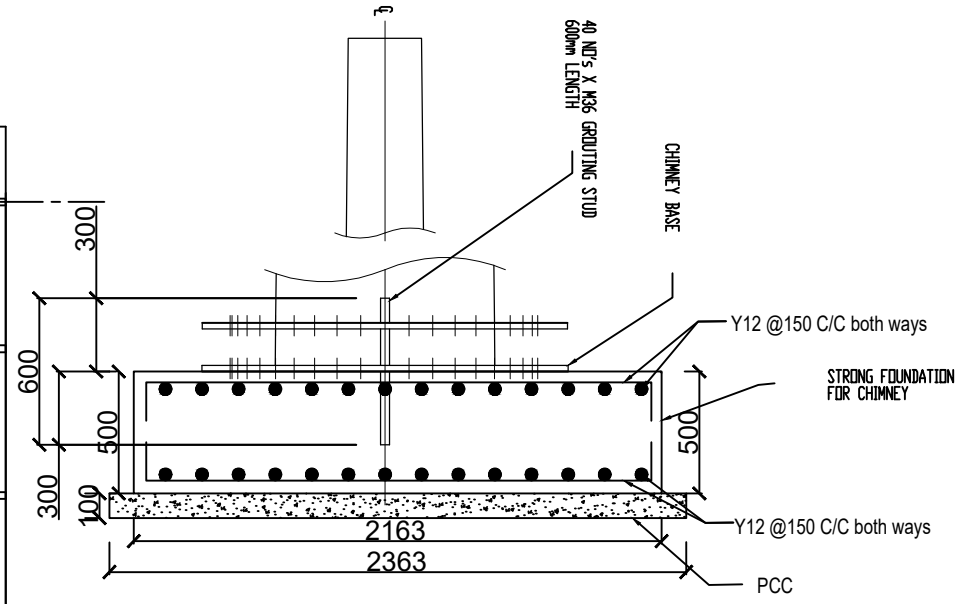
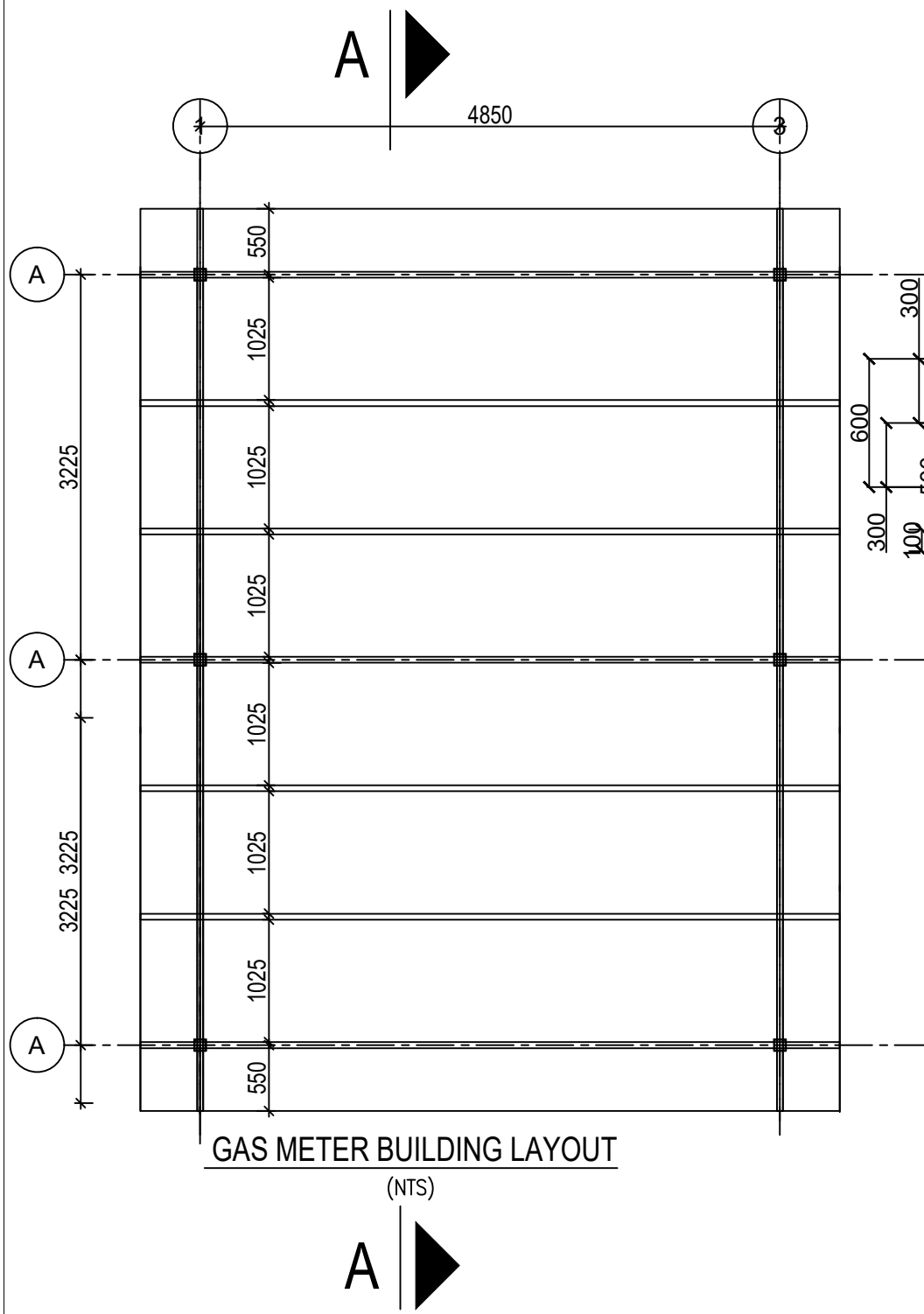
CLIENT
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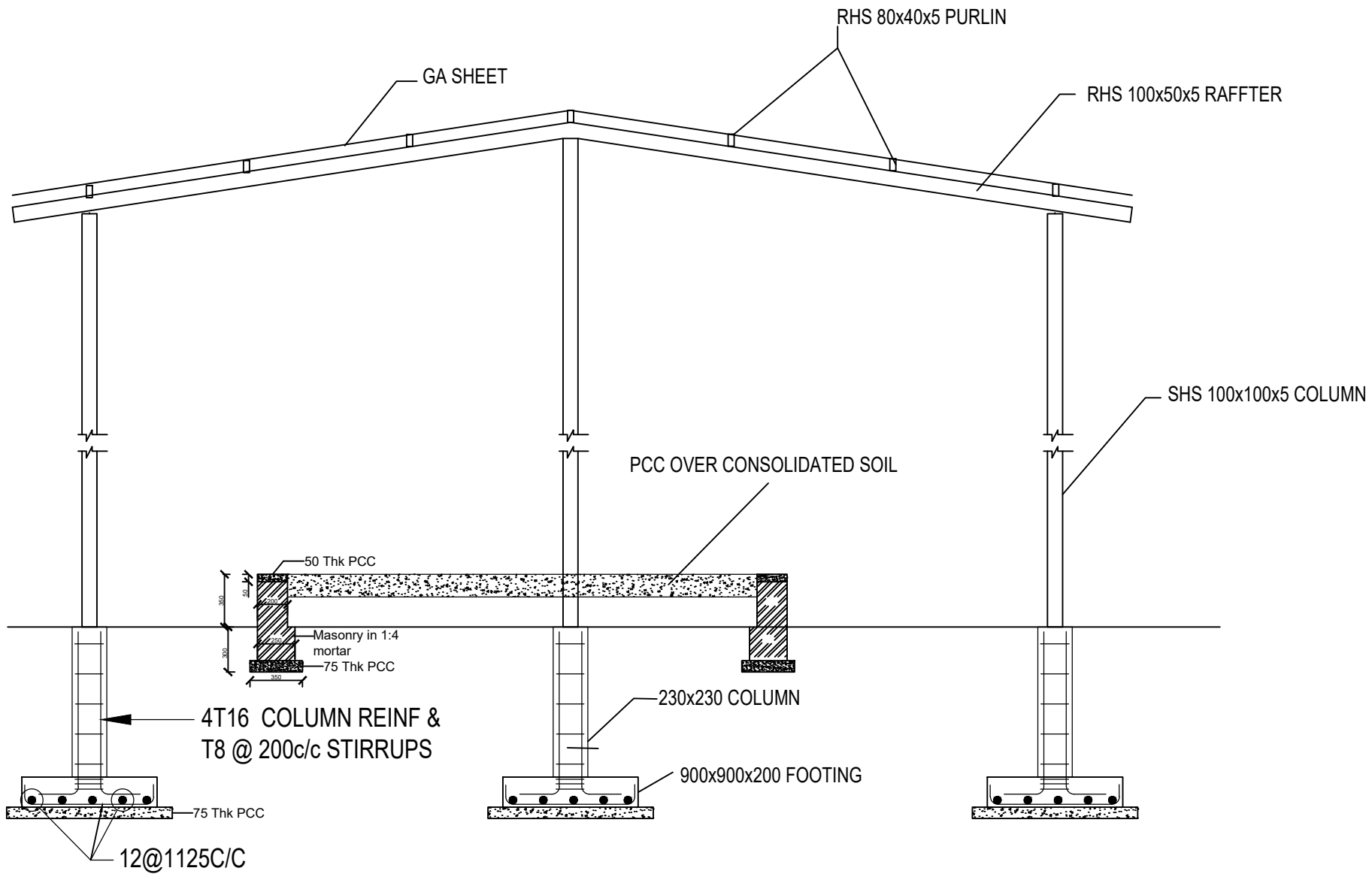
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GENERAL NOTES																		
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SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION														
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R1																		
PRISTINE DESIGN STUDIO ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE, AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE, BANGALORE-560094																		
CONSULTANTS																		
ELECTRICAL CONTRACTOR																		
HVAC CONTRACTOR																		
PROPOSAL																		
STAMP																		
PRJ. NO.: PDS/1817/16 <table border="1"> <tr> <td>DEALT BY</td> <td>CHECKED BY</td> </tr> <tr> <td>PRAKASH</td> <td>SV</td> </tr> <tr> <td>SCALE</td> <td>NYS</td> </tr> <tr> <td>DATE</td> <td>26.09.2022</td> </tr> <tr> <td>UNITS</td> <td>MM</td> </tr> <tr> <td colspan="2">DWS NO.: PDS/18.11.2018</td> </tr> <tr> <td colspan="2">SUPER BUILT UP AREA-179 SQM 1917 SFT</td> </tr> </table>					DEALT BY	CHECKED BY	PRAKASH	SV	SCALE	NYS	DATE	26.09.2022	UNITS	MM	DWS NO.: PDS/18.11.2018		SUPER BUILT UP AREA-179 SQM 1917 SFT	
DEALT BY	CHECKED BY																	
PRAKASH	SV																	
SCALE	NYS																	
DATE	26.09.2022																	
UNITS	MM																	
DWS NO.: PDS/18.11.2018																		
SUPER BUILT UP AREA-179 SQM 1917 SFT																		
DRAWING TITLE																		
CONTROL ROOM TERRACE LAYOUT																		
CLIENT																		
M/s IISC																		
ADDRESS:																		
177																		
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GENERAL NOTES				
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SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
REVISIONS				
R0				
R1				
PRISTINE DESIGN STUDIO				
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094				
CONSULTANTS				
ELECTRICAL CONTRACTOR				
HVAC CONTRACTOR				
PROPOSAL				
STAMP				
PRJ. NO. PDS/1817/18				
DEALT BY PRAKASH		CHECKED BY SV		
SCALE NTS		DATE 26.09.2022		
UNITS MM				
DWS NO. PDS/18.11.2018				
SUPER BUILT UP AREA-179 SQM 1917 SFT				
DRAWING TITLE				
GAS METER BUILDING DETAIL 1				
CLIENT				
M/s IISC				
ADDRESS:				
178				
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SECTION A-A
(NTS)

GENERAL NOTES
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COLUMN POSITION, SIZE AND OTHER STRUCTURAL DETAILS RELATED TO CRANE SHALL BE INCORPORATED IN LATER STAGE

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION

REVISIONS

R0	
R1	

PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 164, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS

ELECTRICAL CONTRACTOR	
HVAC CONTRACTOR	

PROPOSAL

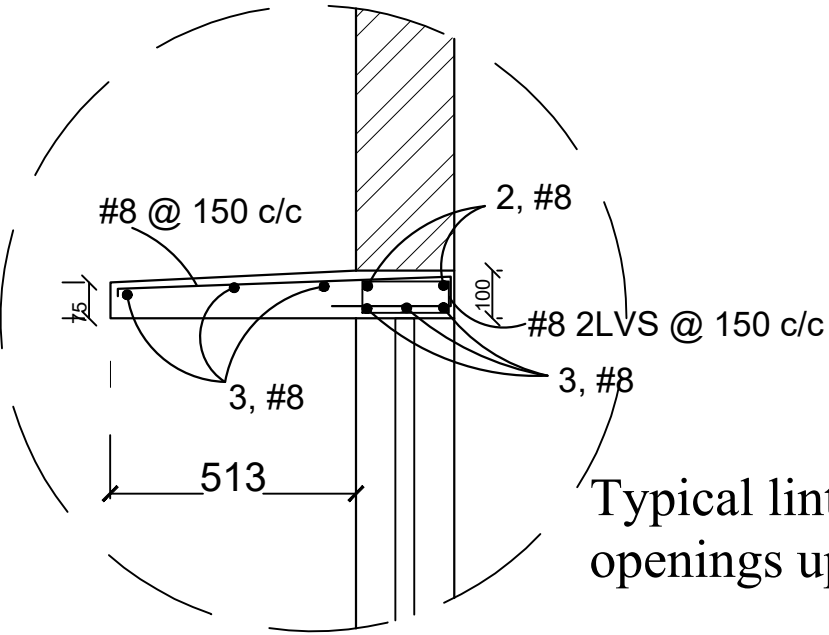
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	UNITS MM	
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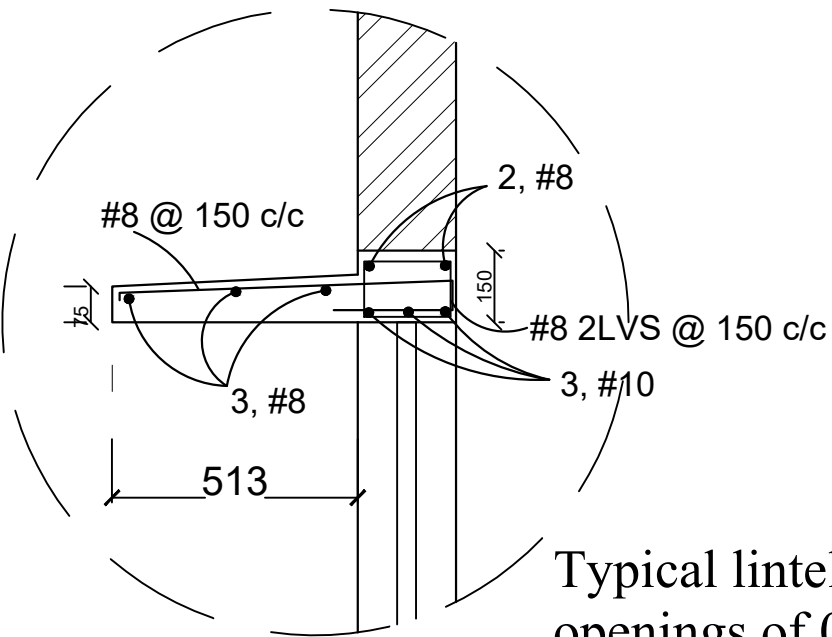
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DETAIL 1

CLIENT
M/s IISC
ADDRESS:

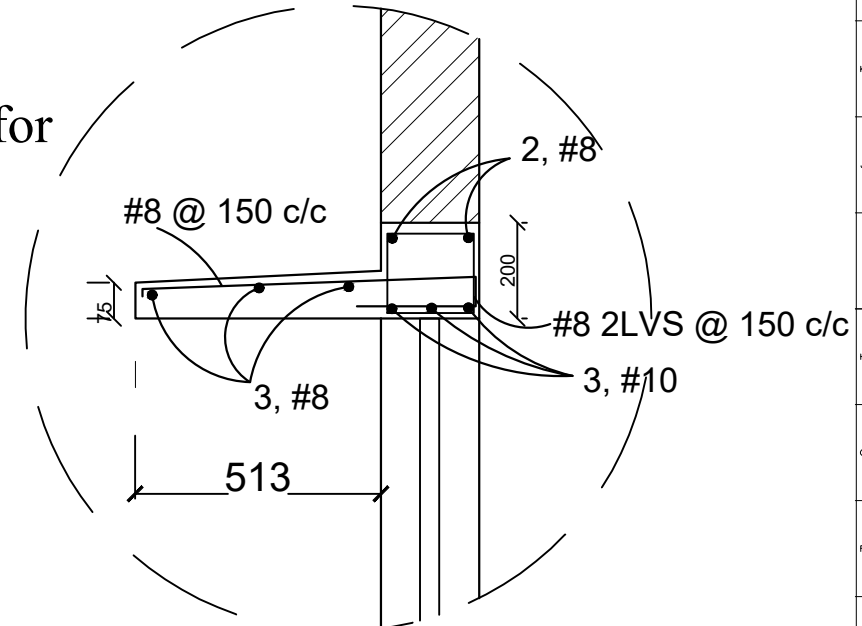
179
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Typical lintel-chajja for openings up to 0.9m



Typical lintel-chajja for openings of 0.9 to 1.5m



Typical lintel-chajja for openings of 1.5 to 2m

GENERAL NOTES

ALL DIMENSIONS IN FT AND INCHES FOLLOW WRITTEN DIMENSIONS.

ANY DISCREPANCY NOTED IN THE DRG SHOULD BE BROUGHT TO THE NOTICE OF THE ARCHITECT/STRUC. CONSULTANT BEFORE EXECUTION.

ALL STRUCTURAL DRGS ARE TO BE IN CONJUNCTION WITH ARCHITECTURAL DRGS.

SCHEME	TENDER	INFORMATION	APPROVAL	CONSTRUCTION
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REVISIONS

R0	
R1	

ARCHITECTS



PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 16/4, 1st CROSS, 1st STAGE AGES LAYOUT, SANJAYNAGAR, RMV 2ND STAGE BANGALORE-560094

CONSULTANTS	
STRUCTURAL	
ELECTRICAL & PHE	
SERVICE CONTRACTORS	
HVAC CONTRACTOR	
ELECTRICAL CONTRACTOR	
PLUMBING CONTRACTOR	

PROPOSAL

STAMP	
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PRJ. NO. PDS/1617/16	DEALT BY NIVA	CHECKED BY SV
	SCALE NTS	DATE 16-06-2022
	DWG No. PDS/16-06-2022	

DRAWING TITLE

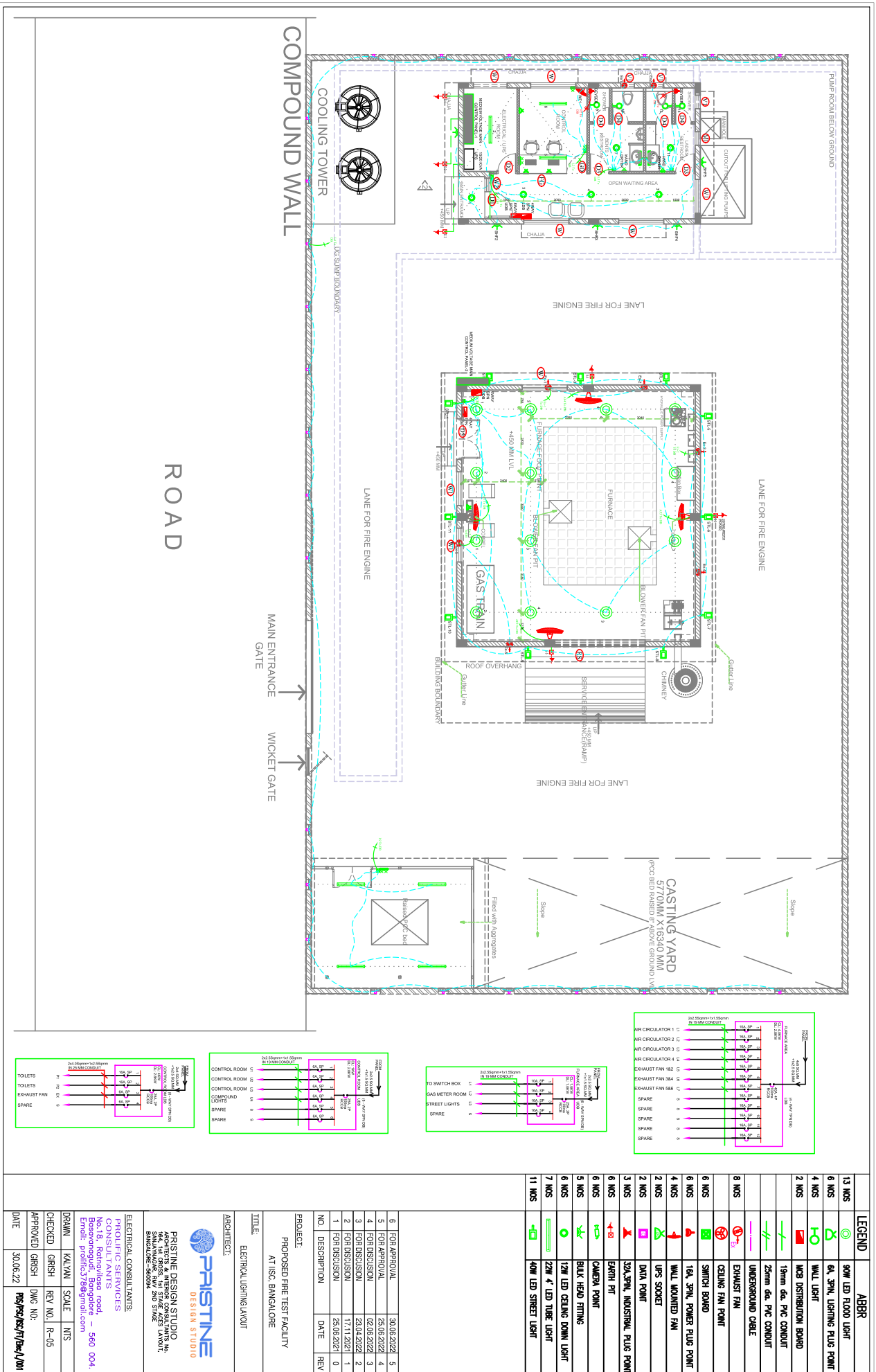
Chajja Detail	REVISION
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CLIENT

IISc

180

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NO	SYMBOL	ABBREV
13 NOS		9W LED FLOOD LIGHT
9 NOS		8A 3P+N LIGHTING PLUG POINT
4 NOS		WALL LIGHT
2 NOS		MBS DISTRIBUTION BOARD
		18mm dia. PVC CONDUIT
		25mm dia. PVC CONDUIT
8 NOS		UNDERGROUND CABLE
		EXHAUST FAN
6 NOS		CEILING FAN POINT
6 NOS		SWITCH BOARD
4 NOS		18A 3P+N POWER PLUG POINT
2 NOS		UPS SOCKET
3 NOS		DATA POINT
3 NOS		32A 3P+N INDUSTRIAL PLUG POINT
6 NOS		EARTH PIT
5 NOS		CAMERA POINT
6 NOS		BULK HEAD FITTING
7 NOS		12W LED CEILING DOWN LIGHT
11 NOS		40W LED STREET LIGHT

NO	DESCRIPTION	DATE	REV
6	FOR APPROVAL	30.06.2022	5
5	FOR APPROVAL	25.06.2022	4
4	FOR DISCUSSION	05.06.2022	3
3	FOR DISCUSSION	23.04.2022	2
2	FOR DISCUSSION	17.11.2021	1
1	FOR DISCUSSION	20.08.2021	0

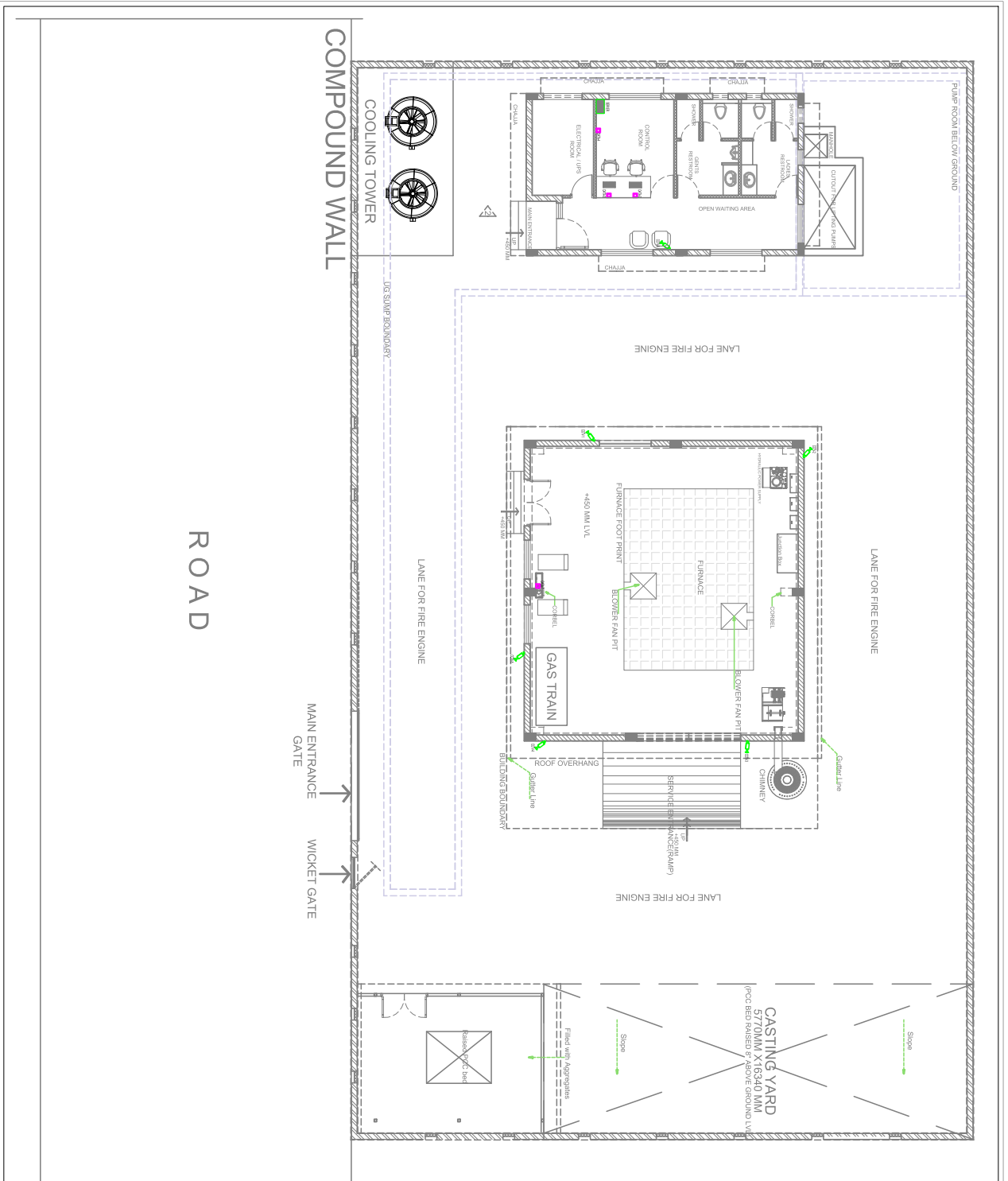
PROJECT: PROPOSED FIRE TEST FACILITY
 AT ISFC, BANGALORE

PRISTINE DESIGN STUDIO
 ARCHITECTS & INTERIOR CONSULTANTS 3RD FLOOR, 2ND STAGE, SML WINDSOR, BANARSA ROAD, BANGALORE-560094

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 Email: pristinestudio@gmail.com

ELECTRICAL CONSULTANTS:
FIRDAUS SERVICES CONSULTANTS
 No.18, Ramanavasa road,
 Basavonagar, Bangalore - 560 004.
 Email: pristinestudio@gmail.com

DRAWN: KALYAN SCALE: NTS
 CHECKED: GIRISH REV. NO.: R-05
 APPROVED: GIRISH DWG. NO.: PHS/PS/ISC/17/Rev/1/01
 DATE: 30.06.22



LEGEND	ABBR
13 NOS	9W LED FLOOD LIGHT
9 NOS	8A, 3PWL LIGHTING PUG POINT
4 NOS	WALL LIGHT
2 NOS	MBS DISTRIBUTION BOARD
	15mm dia. PVC CONDUIT
	25mm dia. PVC CONDUIT
	UNDERGROUND CABLE
8 NOS	EXHAUST FAN
	CEILING FAN POINT
6 NOS	SWITCH BOARD
6 NOS	16A, 3PWL POWER PUG POINT
4 NOS	WALL MOUNTED FAN
2 NOS	UPS SOCKET
2 NOS	DINA POINT
3 NOS	32A, 3PWL INDUSTRIAL PUG POINT
6 NOS	ERRR PIT
6 NOS	CAMERA POINT
5 NOS	BULK HEAD FITTING
6 NOS	12W LED CEILING DOWN LIGHT
7 NOS	12W 4' LED TUBE LIGHT
11 NOS	40W LED STREET LIGHT

NO	DESCRIPTION	DATE	REV
6	FOR APPROVAL	30.06.2022	5
5	FOR APPROVAL	25.06.2022	4
4	FOR DISCUSSION	02.04.2022	3
3	FOR DISCUSSION	23.04.2022	2
2	FOR DISCUSSION	17.11.2021	1
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PROJECT: PROPOSED FIRE TEST FACILITY
AT IISG, BANGALORE

TITLE: ELECTRICAL NETWORK LAYOUT

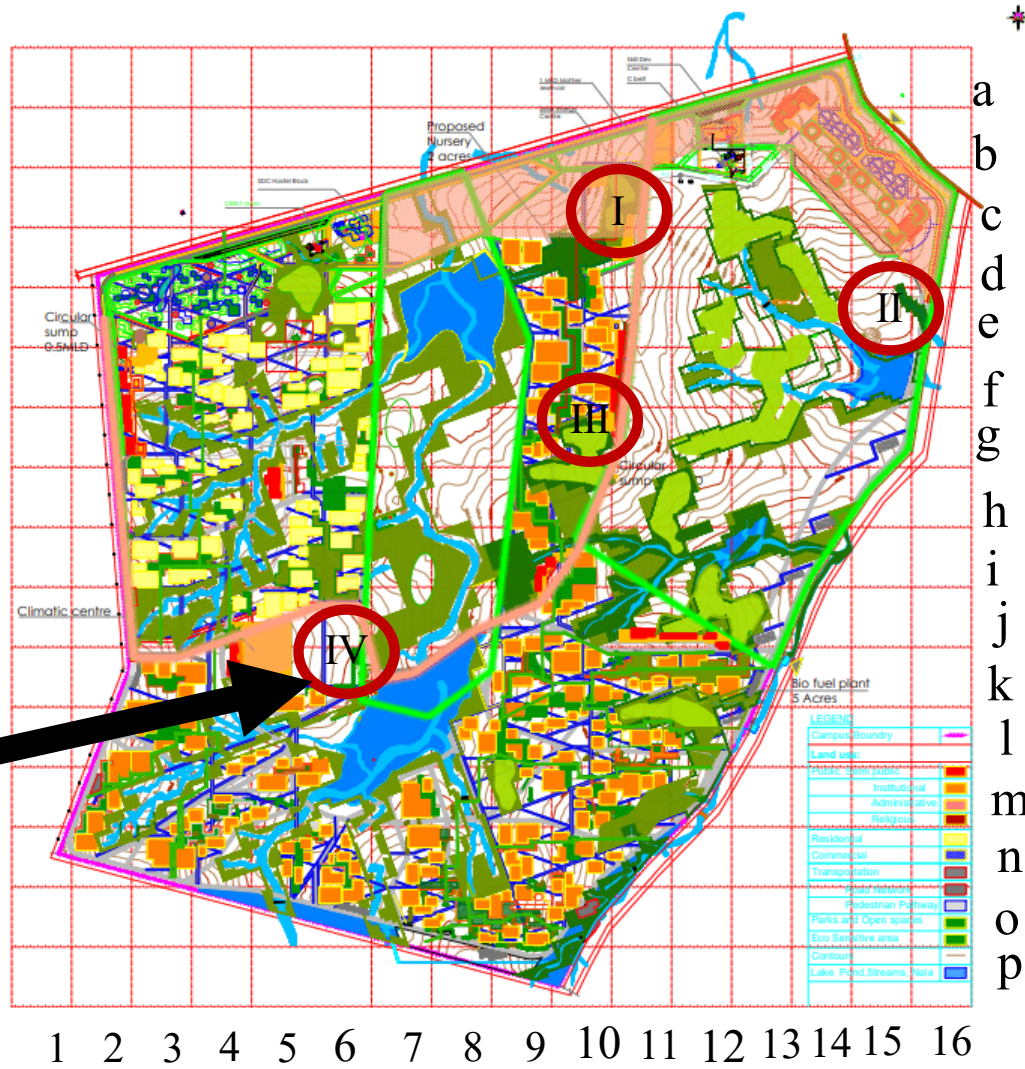
ARCHITECT: **PRISTINE DESIGN STUDIO**

PRISTINE DESIGN STUDIO
ARCHITECTS & INTERIOR CONSULTANTS No. 18, Ratanvijaya road, Basavanagudi, Bangalore - 560 004.
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BANGALORE-560094

ELECTRICAL CONSULTANTS: **PIRO ELECTRIC SERVICES CONSULTANTS**
No.18, Ratanvijaya road, Basavanagudi, Bangalore - 560 004.
Email: pristinedesign@gmail.com

DRAWN: KALYAN SCALE: NTS
CHECKED: GIRISH REV NO: R-05
APPROVED: GIRISH DWG NO: **PEE/PEE/17/Rev/1/003**
DATE: 30.06.22

Location Map



The identified site for setting up the **Proposed Fire Structural Testing Facility**

Map of the IISc Challakere Campus
 Indian Institute of Science,
 Challakere campus at Khudapura,
 Challakere, Chitradurga District,
 Karnataka – 577 536

Annexure

GOI orders related to Public Procurement (Preference to Make in India)

No. P-45021/2/2017-PP (BE-II)
Government of India
Ministry of Commerce and Industry
Department for Promotion of Industry and Internal Trade
(Public Procurement Section)

Udyog Bhawan, New Delhi
Dated: 16th September, 2020

To

All Central Ministries/Departments/CPSUs/All concerned

ORDER

Subject: Public Procurement (Preference to Make in India), Order 2017– Revision; regarding.

Department for Promotion of Industry and Internal Trade, in partial modification [Paras 2, 3, 5, 10 & 13] of Order No.P-45021/2/2017-B.E.-II dated 15.6.2017 as amended by Order No.P-45021/2/2017-B.E.-II dated 28.05.2018, Order No.P-45021/2/2017-B.E.-II dated 29.05.2019 and Order No.P-45021/2/2017-B.E.-II dated 04.06.2020, hereby issues the revised 'Public Procurement (Preference to Make in India), Order 2017' dated 16.09.2020 effective with immediate effect.

Whereas it is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of goods and services in India with a view to enhancing income and employment, and

Whereas procurement by the Government is substantial in amount and can contribute towards this policy objective, and

Whereas local content can be increased through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them,

Now therefore the following Order is issued:

1. This Order is issued pursuant to Rule 153 (iii) of the General Financial Rules 2017.
2. **Definitions:** For the purposes of this Order:

'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-I local supplier' under this Order.

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'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-II local supplier' but less than that prescribed for 'Class-I local supplier' under this Order.

'Non - Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier' under this Order.

'L1' means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

'Margin of purchase preference' means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L1 for the purpose of purchase preference.

'Nodal Ministry' means the Ministry or Department identified pursuant to this order in respect of a particular item of goods or services or works.

'Procuring entity' means a Ministry or department or attached or subordinate office of, or autonomous body controlled by, the Government of India and includes Government companies as defined in the Companies Act.

'Works' means all works as per Rule 130 of GFR- 2017, and will also include 'turnkey works'.

3. Eligibility of 'Class-I local supplier' / 'Class-II local supplier' / 'Non-local suppliers' for different types of procurement

(a) In procurement of all goods, services or works in respect of which the Nodal Ministry / Department has communicated that there is sufficient local capacity and local competition, only 'Class-I local supplier', as defined under the Order, shall be eligible to bid irrespective of purchase value.

(b) Only 'Class-I local supplier' and 'Class-II local supplier', as defined under the Order, shall be eligible to bid in procurements undertaken by procuring entities, except when Global tender enquiry has been issued. In global tender enquiries, 'Non-local suppliers' shall also be eligible to bid along with 'Class-I local suppliers' and 'Class-II local suppliers'. In procurement of all goods, services or works, not covered by sub-para 3(a) above, and with estimated value of purchases less than Rs. 200 Crore, in accordance with Rule 161(iv) of GFR, 2017, Global tender enquiry shall not be issued except with the approval of competent authority as designated by Department of Expenditure.

(c) For the purpose of this Order, works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts.

.....Contd. p/3

3A. Purchase Preference

(a) Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to 'Class-I local supplier' in procurements undertaken by procuring entities in the manner specified here under.

(b) In the procurements of goods or works, which are covered by para 3(b) above and which are divisible in nature, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.
- ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L1 bidder.

(c) In the procurements of goods or works, which are covered by para 3(b) above and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.
- ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
- iii. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.

.....Contd. p/4

- (d) "Class-II local supplier" will not get purchase preference in any procurement, undertaken by procuring entities.

3B. Applicability in tenders where contract is to be awarded to multiple bidders -

In tenders where contract is awarded to multiple bidders subject to matching of L1 rates or otherwise, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- a) In case there is sufficient local capacity and competition for the item to be procured, as notified by the nodal Ministry, only Class I local suppliers shall be eligible to bid. As such, the multiple suppliers, who would be awarded the contract, should be all and only 'Class I Local suppliers'.
- b) In other cases, 'Class II local suppliers' and 'Non local suppliers' may also participate in the bidding process along with 'Class I Local suppliers' as per provisions of this Order.
- c) If 'Class I Local suppliers' qualify for award of contract for at least 50% of the tendered quantity in any tender, the contract may be awarded to all the qualified bidders as per award criteria stipulated in the bid documents. However, in case 'Class I Local suppliers' do not qualify for award of contract for at least 50% of the tendered quantity, purchase preference should be given to the 'Class I local supplier' over 'Class II local suppliers'/'Non local suppliers' provided that their quoted rate falls within 20% margin of purchase preference of the highest quoted bidder considered for award of contract so as to ensure that the 'Class I Local suppliers' taken in totality are considered for award of contract for at least 50% of the tendered quantity.
- d) First purchase preference has to be given to the lowest quoting 'Class-I local supplier', whose quoted rates fall within 20% margin of purchase preference, subject to its meeting the prescribed criteria for award of contract as also the constraint of maximum quantity that can be sourced from any single supplier. If the lowest quoting 'Class-I local supplier', does not qualify for purchase preference because of aforesaid constraints or does not accept the offered quantity, an opportunity may be given to next higher 'Class-I local supplier', falling within 20% margin of purchase preference, and so on.
- e) To avoid any ambiguity during bid evaluation process, the procuring entities may stipulate its own tender specific criteria for award of contract amongst different bidders including the procedure for purchase preference to 'Class-I local supplier' within the broad policy guidelines stipulated in sub-paras above.

4. **Exemption of small purchases:** Notwithstanding anything contained in paragraph 3, procurements where the estimated value to be procured is less than Rs. 5 lakhs shall be exempt from this Order. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this Order.

5. **Minimum local content:** The 'local content' requirement to categorize a supplier as 'Class-I local supplier' is minimum 50%. For 'Class-II local supplier', the 'local content' requirement is minimum 20%. Nodal Ministry/ Department may prescribe only a higher

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percentage of minimum local content requirement to categorize a supplier as 'Class-I local supplier'/ 'Class-II local supplier'. For the items, for which Nodal Ministry/ Department has not prescribed higher minimum local content notification under the Order, it shall be 50% and 20% for 'Class-I local supplier'/ 'Class-II local supplier' respectively.

6. **Margin of Purchase Preference:** The margin of purchase preference shall be 20%.
7. **Requirement for specification in advance:** The minimum local content, the margin of purchase preference and the procedure for preference to Make in India shall be specified in the notice inviting tenders or other form of procurement solicitation and shall not be varied during a particular procurement transaction.
8. **Government E-marketplace:** In respect of procurement through the Government E-marketplace (GeM) shall, as far as possible, specifically mark the items which meet the minimum local content while registering the item for display, and shall, wherever feasible, make provision for automated comparison with purchase preference and without purchase preference and for obtaining consent of the local supplier in those cases where purchase preference is to be exercised.
9. **Verification of local content:**
 - a. The 'Class-I local supplier'/ 'Class-II local supplier' at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local supplier', as the case may be. They shall also give details of the location(s) at which the local value addition is made.
 - b. In cases of procurement for a value in excess of Rs. 10 crores, the 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
 - c. Decisions on complaints relating to implementation of this Order shall be taken by the competent authority which is empowered to look into procurement-related complaints relating to the procuring entity.
 - d. Nodal Ministries may constitute committees with internal and external experts for independent verification of self-declarations and auditor's/ accountant's certificates on random basis and in the case of complaints.
 - e. Nodal Ministries and procuring entities may prescribe fees for such complaints.
 - f. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

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- g. A supplier who has been debarred by any procuring entity for violation of this Order shall not be eligible for preference under this Order for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in the manner prescribed under paragraph 9h below.
- h. The Department of Expenditure shall issue suitable instructions for the effective and smooth operation of this process, so that:
 - i. The fact and duration of debarment for violation of this Order by any procuring entity are promptly brought to the notice of the Member-Convenor of the Standing Committee and the Department of Expenditure through the concerned Ministry /Department or in some other manner;
 - ii. on a periodical basis such cases are consolidated and a centralized list or decentralized lists of such suppliers with the period of debarment is maintained and displayed on website(s);
 - iii. in respect of procuring entities other than the one which has carried out the debarment, the debarment takes effect prospectively from the date of uploading on the website(s) in the such a manner that ongoing procurements are not disrupted.

10. Specifications in Tenders and other procurement solicitations:

- a. Every procuring entity shall ensure that the eligibility conditions in respect of previous experience fixed in any tender or solicitation do not require proof of supply in other countries or proof of exports.
- b. Procuring entities shall endeavour to see that eligibility conditions, including on matters like turnover, production capability and financial strength do not result in unreasonable exclusion of 'Class-I local supplier'/ 'Class-II local supplier' who would otherwise be eligible, beyond what is essential for ensuring quality or creditworthiness of the supplier.
- c. Procuring entities shall, within 2 months of the issue of this Order review all existing eligibility norms and conditions with reference to sub-paragraphs 'a' and 'b' above.

d. Reciprocity Clause

- i. When a Nodal Ministry/Department identifies that Indian suppliers of an item are not allowed to participate and/ or compete in procurement by any foreign government, due to restrictive tender conditions which have direct or indirect effect of barring Indian companies such as registration in the procuring country, execution of projects of specific value in the procuring country etc., it shall provide such details to all its procuring entities including CMDs/CEOs of PSEs/PSUs, State Governments and other procurement agencies under their administrative control and GeM for appropriate reciprocal action.

.....Contd. p/7

- ii. Entities of countries which have been identified by the nodal Ministry/Department as not allowing Indian companies to participate in their Government procurement for any item related to that nodal Ministry shall not be allowed to participate in Government procurement in India for all items related to that nodal Ministry/ Department, except for the list of items published by the Ministry/ Department permitting their participation.
 - iii. The stipulation in (ii) above shall be part of all tenders invited by the Central Government procuring entities stated in (i) above. All purchases on GeM shall also necessarily have the above provisions for items identified by nodal Ministry/ Department.
 - iv. State Governments should be encouraged to incorporate similar provisions in their respective tenders.
 - v. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time.
- e. Specifying foreign certifications/ unreasonable technical specifications/ brands/ models in the bid document is restrictive and discriminatory practice against local suppliers. If foreign certification is required to be stipulated because of non-availability of Indian Standards and/or for any other reason, the same shall be done only after written approval of Secretary of the Department concerned or any other Authority having been designated such power by the Secretary of the Department concerned.
- f. "All administrative Ministries/Departments whose procurement exceeds Rs. 1000 Crore per annum shall notify/ update their procurement projections every year, including those of the PSEs/PSUs, for the next 5 years on their respective website."

10A. Action for non-compliance of the Provisions of the Order: In case restrictive or discriminatory conditions against domestic suppliers are included in bid documents, an inquiry shall be conducted by the Administrative Department undertaking the procurement (including procurement by any entity under its administrative control) to fix responsibility for the same. Thereafter, appropriate action, administrative or otherwise, shall be taken against erring officials of procurement entities under relevant provisions. Intimation on all such actions shall be sent to the Standing Committee.

11. Assessment of supply base by Nodal Ministries: The Nodal Ministry shall keep in view the domestic manufacturing / supply base and assess the available capacity and the extent of local competition while identifying items and prescribing the higher minimum local content or the manner of its calculation, with a view to avoiding cost increase from the operation of this Order.

12. Increase in minimum local content: The Nodal Ministry may annually review the local content requirements with a view to increasing them, subject to availability of sufficient local competition with adequate quality.

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13. **Manufacture under license/ technology collaboration agreements with phased indigenization:** While notifying the minimum local content, Nodal Ministries may make special provisions for exempting suppliers from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who holds intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content.

13A. In procurement of all goods, services or works in respect of which there is substantial quantity of public procurement and for which the nodal ministry has not notified that there is sufficient local capacity and local competition, the concerned nodal ministry shall notify an upper threshold value of procurement beyond which foreign companies shall enter into a joint venture with an Indian company to participate in the tender. Procuring entities, while procuring such items beyond the notified threshold value, shall prescribe in their respective tenders that foreign companies may enter into a joint venture with an Indian company to participate in the tender. The procuring Ministries/Departments shall also make special provisions for exempting such joint ventures from meeting the stipulated minimum local content requirement, which shall be increased in a phased manner.

14. **Powers to grant exemption and to reduce minimum local content:** The administrative Department undertaking the procurement (including procurement by any entity under its administrative control), with the approval of their Minister-in-charge, may by written order, for reasons to be recorded in writing,

- a. reduce the minimum local content below the prescribed level; or
- b. reduce the margin of purchase preference below 20%; or
- c. exempt any particular item or supplying entities from the operation of this Order or any part of the Order.

A copy of every such order shall be provided to the Standing Committee and concerned Nodal Ministry / Department. The Nodal Ministry / Department concerned will continue to have the power to vary its notification on Minimum Local Content.

15. **Directions to Government companies:** In respect of Government companies and other procuring entities not governed by the General Financial Rules, the administrative Ministry or Department shall issue policy directions requiring compliance with this Order.

16. **Standing Committee:** A standing committee is hereby constituted with the following membership:

Secretary, Department for Promotion of Industry and Internal Trade—Chairman
Secretary, Commerce—Member
Secretary, Ministry of Electronics and Information Technology—Member
Joint Secretary (Public Procurement), Department of Expenditure—Member
Joint Secretary (DPIIT)—Member-Convenor

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The Secretary of the Department concerned with a particular item shall be a member in respect of issues relating to such item. The Chairman of the Committee may co-opt technical experts as relevant to any issue or class of issues under its consideration.

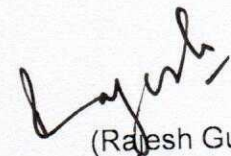
17. Functions of the Standing Committee: The Standing Committee shall meet as often as necessary, but not less than once in six months. The Committee

- a. shall oversee the implementation of this order and issues arising therefrom, and make recommendations to Nodal Ministries and procuring entities.
- b. shall annually assess and periodically monitor compliance with this Order
- c. shall identify Nodal Ministries and the allocation of items among them for issue of notifications on minimum local content
- d. may require furnishing of details or returns regarding compliance with this Order and related matters
- e. may, during the annual review or otherwise, assess issues, if any, where it is felt that the manner of implementation of the order results in any restrictive practices, cartelization or increase in public expenditure and suggest remedial measures
- f. may examine cases covered by paragraph 13 above relating to manufacture under license/ technology transfer agreements with a view to satisfying itself that adequate mechanisms exist for enforcement of such agreements and for attaining the underlying objective of progressive indigenization
- g. may consider any other issue relating to this Order which may arise.

18. Removal of difficulties: Ministries /Departments and the Boards of Directors of Government companies may issue such clarifications and instructions as may be necessary for the removal of any difficulties arising in the implementation of this Order.

19. Ministries having existing policies: Where any Ministry or Department has its own policy for preference to local content approved by the Cabinet after 1st January 2015, such policies will prevail over the provisions of this Order. All other existing orders on preference to local content shall be reviewed by the Nodal Ministries and revised as needed to conform to this Order, within two months of the issue of this Order.

20. Transitional provision: This Order shall not apply to any tender or procurement for which notice inviting tender or other form of procurement solicitation has been issued before the issue of this Order.



(Rajesh Gupta)
Director

Tel: 23063211

rajesh.gupta66@gov.in

P-45021/102/2019-BE-II-Part(1) (E- 50310)
Government of India
Ministry of Commerce and Industry
Department of Promotion of Industry and Internal Trade
(Public Procurement Section)

Udyog Bhawan Delhi-110011

Dated March 4, 2021

OFFICE MEMORANDUM

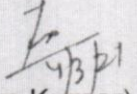
Subject: Clarification for local content calculation PPP-MII Order –reg.

The undersigned is directed to refer Public Procurement (Preference to Make in India) Order dated 2017, as amended on 16.09.2020 regarding purchase preference for local manufactured items in Public Procurement.

2. References have been received in this department from various procuring entities wherein procuring entities have sought clarification as to whether the bidders offering imported content can claim themselves as Class-I local/Class-II local suppliers claiming the services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC/CMC etc. as local value addition.

3. In this regard it is clarified that the bidders offering imported products will fall under the category of Non- local suppliers. They can't claim themselves as Class-I local suppliers/Class-II local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC/CMC etc. as local value addition.

4. This issues with the approval of competent authority.



(Pritam Kumar)

Under Secretary to Government of India

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To

All Ministries/Departments of Government of India