

# **PUDUCHERRY SMART CITY DEVELOPMENT LIMITED**



## **REQUEST FOR PROPOSAL**

**DESIGN, DEVELOP, IMPLEMENT, OPERATE,  
MAINTAIN AND TRANSFER MULTI-LEVEL FOUR-  
WHEELER MECHANIZED PARKING AT OLD JAIL  
COMPLEX IN JN STREET & OLD PORT COMPLEX IN  
PUDUCHERRY**

**Tender ID: 34/PSCDL/2020-21**

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**CHIEF EXECUTIVE OFFICER**

**PUDUCHERRY SMART CITY DEVELOPMENT LIMITED**

No.2. Bussy street, Old court building, Puducherry- 605 001

Phone : 0413-2224433, 2224434

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### **CONTENT OF BIDDING DOCUMENTS**

The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 9:

- SECTION 1 : Notice inviting Bid**
- SECTION 2 : Instruction to Bidders**
- SECTION 3 : Technical Specifications**
- SECTION 4 : Bill of quantities (schedule –A)**
- SECTION 5 : Forms of Bid**
- SECTION 6 : Drawings and Annexure**

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# **SECTION 1**

## **NOTICE INVITING TENDER**

**PUDUCHERRY SMART CITY DEVELOPMENT LIMITED**

No.2, Old Court Building, Bussy street, Puducherry-605001  
Email:pondysmartcity@gmail.com. Phone-+91-413-2224431

**No.1040/PSCDL/MLCP/2020-21/**

**Puducherry, dt.02.02.2021**

**NOTICE INVITING TENDER**

Puducherry Smart City Development Limited Invites Online tenders from eligible contractors having relevant experience to Design, Develop, Implement, Operate, Maintain and Transfer Multi-Level Four-Wheeler Mechanized Parking in Puducherry.

S. No.	Description	Cost of Tender Form	Earnest Money Deposit	Completion Period
1	Design, Develop, Implement, Operate, Maintain and Transfer Multi-Level Four-Wheeler Mechanized Parking (Vertical rotary/Puzzle) at Old Jail Complex in JN Street & Old Port Complex in Puducherry	Rs. 1500/- +GST 5%	Rs.20,00,000/-	9 Months for Construction + 02 Years for (O&M)

**Key Dates:**

S. No.	Description	Date and Time
1	Date of Publication of Tender (Online)	02.02.2021 – 4 pm
2	Last date for submission of tender (Online)	17.02.2021 – 4 pm
3	Pre bid Meeting	11.02.2021 – 11am
4	Technical bid opening (Online)	18.02.2021 – 11am
5	Financial bid	will be intimate later

**Note:**

1. The complete bid document can be viewed / downloaded from official portal of <https://smartnet.niua.org/tenders> , <http://pondicherrysmartcity.in> and e-procurement portal of Govt. of Puducherry <https://pudutenders.gov.in>. But the Tenders can be submitted online through <https://pudutenders.gov.in>. Only.
2. For other details please refer the RFPs/NIT uploaded in the above websites.
3. Bid Fee and Earnest Money Deposit shall be paid online through the payment Gateway provided at <https://pudutenders.gov.in> at the time of submission of bid.
4. Subsequent corrigendum/addendum if any shall be available only in web site indicated above.
5. The authority reserves the right to reject for any or all bids without assigning any reason.

**CHIEF EXECUTIVE OFFICER  
PSCDL**

## **DISCLAIMER**

The information contained in this Request for Proposal document ("RFP") or subsequently provided to Bidders, whether orally or in documentary or any other form by or on behalf of the Puducherry Smart City Development Limited or any of its employees or advisers, is provided to Bidders on the terms & conditions set out in this RFP such other terms conditions subject to which such information is provided.

This RFP is not an agreement is neither an offer nor invitation by the Puducherry Smart City Development Limited, (hereafter it will be referred as "PSCDL") to the prospective Bidders or any other person. The purpose of this RFP is to provide interested parties with information that may be useful to them in the formulation of their Proposals pursuant to this RFP.

This RFP includes statements, which reflects the intentions of the Puducherry Smart City Development Ltd. in relation to the Selection of Bidder to Design, Develop, Implement, Operate, Maintain and Transfer Smart Multi-Level parking (rotary /puzzle) for PSCDL.

The Puducherry Smart City Development Limited, its employees advisers make no representation or warranty shall have no liability to any person including any Bidder under any law, statute, rules or regulations or part, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything and contained in this RFP or otherwise, including the accuracy, adequacy, correctness, reliability or completeness of the RFP any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way in this Selection Process.

The Puducherry Smart City Development Limited also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any Bidder upon the statements contained in this RFP.

The Puducherry Smart City Development Limited may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this RFP.

The issue of this RFP does not imply that the Puducherry Smart City Development Limited is bound to award the Licensee or to appoint the Selected Licensee, as the case may be, for the award of license for installation/ erection of Smart Mechanized Parking (Vertical rotary /puzzle) Systems on the identified locations. Puducherry Smart City Development Limited reserves the right to reject all or any of the Proposals without assigning any reasons whatsoever.

The Bidders shall bear all its costs associated with or relating to the preparation submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated in connection with or relating to its Proposal. All such costs expenses will remain with the Bidders the Puducherry Smart City Development Ltd. shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation for submission of the Proposal, regardless of the conduct or outcome of the Selection Process.

## **SECTION 2**

### **INSTRUCTION TO BIDDERS**





3. Geotechnical investigation reports of the mentioned sites are as per ***annexure-I***.
4. There is a potential scope for demand for parking within the said location since the locations exists in major commercial / tourist areas and all the major transportation nodes are in a walkable distance.
5. All this functionalities / project site location / nearby land uses create a significant commercial potential for its operator. Thus, this project can result in a “win-win” situation for the citizens, government, and businesses.
6. The successful applicant shall be solely and exclusively responsible to design, Engineer, Construct, Operate, Maintain & Transfer the proposed project on a DBOT model and to provide the services which would be defined in the RFP.
7. The maintenance period will be of 2 years after the construction and commission of the project.
8. **No CHINA make** / product will be allowed in this project.
9. The successful applicant shall have right to use the specified area (which will be specified in the RFP document) in Puducherry Municipal (PM) area to create infrastructure such as multi-level car parking in an optimum manner.
10. Land free of encumbrance shall be provided to the Developer for developing the Project components.
11. The Developer can form a Consortium. The Consortium may consist of not more than 2 parties with one lead member and another Consortium member. The developer needs to provide the details of firm wise activities that will be performed by the Consortium.

## 2. SCOPE OF BID

1. Supply, installation, erection, testing & commissioning & two Year Comprehensive Operation and maintenance contract of Parking System with Electro Mechanical technology to accommodate minimum 100 Nos. of four-wheeler with suitable steel structure frame work, Independent motorized pallet having up/down movement with electro-mechanical technology complete with PLC and electrical installation etc. as per specification and direction of Puducherry Smart City Development Ltd. The system shall be designed to accommodate 50% SUV's Four-Wheeler and 50% Sedan cars with average retrieval/parking time not more than 180 seconds. The maximum permissible height of the parking structure above the floor level on the ground shall be 20 metres and shall also abide by the recent norms of Town and Country planning department, Puducherry.
2. Provide required electrical, mechanical and automation for MLCP.
3. Provide all software and hardware required for automation and commissioning the MLCP.
4. Other amenities Civil work, Civil foundations and Finished Flooring over the system, necessary Power back up, Firefighting System as per NBC norms, Electrical Cabling including Main, four-Wheeler Parking Panel with ELCB, Earthing, Lighting arrester as per approved plans will be in the scope of Contractor.
5. Facade development work for MLCP shall be in the scope of the contractor. The drawing of the facade development shall be approved by the engineer-in-charge.

6. Digital display signage boards and CCTV surveillance has to be provided at site.
7. The bidder shall install brand new equipment and the same shall be free from all defects and faults in material, workmanship, and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for materials of the type ordered and shall perform in full conformity with the specifications and drawings. The Contractor shall be responsible for execution of work without any defects that may develop under the conditions provided by the Contractor and under use, arising from faulty materials, design or workmanship such as corrosion of the equipment, inadequate contact protection, deficiencies in circuit design and or otherwise and shall rectify if any defects occur at his own cost when called upon to do so by the PSCDL.
8. The entire project will be financed by PSCDL. Further PSCDL reserves the right to collect the revenue from MLCP during operations maintenance period.
9. Contractor shall submit Structure stability certificate for 10 years for all the components of electro Mechanized Parking (Vertical Rotary /Puzzle) system from any Government Engineering Institution / College recommended by PSCDL.
10. Third party inspection: The PSCDL may appoint any approved government agency/Authority or any person for third party inspection of the work, on contractor's cost.
11. All labor, materials, tools plants, machinery, equipment, and any other things required for execution for work shall be arranged by the CONTRACTOR at his own cost.
12. All arrangements for establishment, watch & ward of stores and security of sites, appropriate vehicles for transportation etc. shall have to be made by the CONTRACTOR at his own cost and nothing extra on this account shall be paid.
13. Testing and Commissioning shall include furnishing all labor, materials, instruments etc. and incidentals necessary for complete testing of each component as per the IS / NBC specifications and manufacturer's recommendations.
14. On the completion of the work, the CONTRACTOR shall clear away and remove from the site all construction plants, temporary works, surplus material and rubbish of every kind and leave the site and works clean to the satisfaction of the Engineer-in-charge.
15. In view of the site location and their prevailing condition, it is mandatory on the Contractor to visit the site and make himself thoroughly familiar with the site conditions, access and account for all possible difficulties and other requirements mentioned elsewhere in his bid prior to submission. When a contractor submits his bid for this work, it will be considered that he has quoted for this work with full and complete knowledge of the site and prevailing conditions, and no claim for additional compensation shall be entertained on this account.
16. It is clarified that bidder should read carefully understand design features as mentioned in "Design Feature" in the para below so that the Bidder is familiarized with the scope of work while submitting a Bid.

17. All necessary statutory clearances / permissions such as approval from Puducherry Planning authority, Puducherry Municipality, Electricity services connection, PCZMA etc has to be obtained by bidder. However, the actual fees incurred will be paid by PSCDL.
18. The contractor shall submit the as built drawing, other specifications & additional maintenance, and Operation standard other than mentioned in the RFP.
19. **Comprehensive Operation and Maintenance:** The successful bidder/ CONTRACTOR will be required to undertake Operation & maintenance of the Parking System as per the following terms:
  - a) The CONTRACTOR shall at all times maintain, keep in good operating condition, repair, and renew, replace and upgrade to the extent reasonably necessary, the equipment, systems, and facilities. All maintenance and repair works shall be carried out in such a way as to minimize inconvenience to users of the Parking Systems.
  - b) Maintenance shall generally be allowed at nonpeak hours only.
  - c) The complete Mechanized system shall have the provision of emergency evacuation of vehicles manually also.
  - d) Contractor should maintain all the necessary INVENTORY of electro-mechanical parts of the system during Comprehensive Operation and maintenance period and also provide a list parts prone to wear and tear during regular operation to PSCDL authorities at the time of handing over after two-year Comprehensive Operation and maintenance.
  - e) During the Operation and Maintenance period, the successful bidder shall replace the damaged/defective/worn out parts at his own cost to ensure smooth functioning of MLCP.
  - f) The CONTRACTOR shall maintain a complaint register, duly paged, at site and shall make it available to the users of the parking to note down the complaints. "PUDUCHERRY SMART CITY DEVELOPMENT LIMITED will have the right to check the complaint book as and when required. The complaint register will be kept properly, and it shall be mentioned on the display signboard about its availability.
  - g) Transfer of facility to "PUDUCHERRY SMART CITY DEVELOPMENT LIMITED. The CONTRACTOR shall transfer the parking facility to "PUDUCHERRY SMART CITY DEVELOPMENT LIMITED, free and clear of any encumbrances on completion of or termination of contract, whichever is earlier.
  - h) During the Comprehensive Operation and maintenance period prior to anticipate transfer of the Facility the CONTRACTOR shall provide such training services to the representatives and employees of Engineer In Charge "PUDUCHERRY SMART CITY DEVELOPMENT LIMITED, or its nominated agency to operate and maintain the Facilities efficiently and safely following such transfer.
20. The successful bidder will be expected to complete the works in **9 months** from the date of signing of the agreement.
21. Detailed description of work is given in General Technical Specifications.

### 3. ELIGIBILITY AND QUALIFICATION OF BIDDERS

- a) The Bidders have to be reputed firms/companies or contractor registered in Central/State Government Departments/Government undertakings having experience for a minimum period of five (5 years) and should have completed at least one similar work (MLCP) with minimum **100 cars Electro-Mechanical** automatic staking facility (vertical rotary/Puzzle) **(or)** two similar work one similar work (MLCP) with minimum **50 cars Electro-Mechanical** automatic staking facility (vertical rotary/Puzzle)
- b) The Bidders should enclose a EMD for an amount of **INR 20, 00,000.00 (Rs. twenty lakhs only)** Earnest Money Deposit (EMD) shall be paid online through the payment Gateway provided at <https://pudutenders.gov.in> at the time of submission of bid. The scanned copy of Bid Security for the same should have been enclosed in the technical bid.
- c) Where the Applicant is a consortium, Firms / Companies or Contractors shall produce the **MOU / MOA**. The lead member should satisfy the condition ITB 3(a).
- d) The completion certificate / proof for having satisfactorily completed similar project given by the client should be enclosed by the bidders.
- e) The Bidders shall produce audited balance sheets for the last three years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability with positive net worth of minimum **INR 10.00 crores (Rs. Ten crores) in any one of the last three years ending on 31-03-2020.**
- f) The Bidders should enclose the latest GST, ESI, EPF and Group insurance registration certificates.
- g) Price Bid (cover – C) will be opened after satisfying the eligible criteria given in the technical bid (Cover – B) in the presence of eligible bidders.
- h) All bidders shall furnish the attested copies of Income Tax returns, GST return during the last 3 years.
- i) All bidders shall provide details required as per Form in Section 4, Forms of Bid and Qualification Information.
- j) All bidders shall provide a declaration stating that they become ineligible if they are found corrupt and fraudulent for their malpractices as defined by Government in accordance with **ITB 20**.
- k) All bidders shall provide copies of original documents duly attested, defining the constitution or legal status, place of registration, principal place of business and written power of attorney.
- l) All bidders shall submit documents relating to qualifications and experience of key personnel for site management and technical personnel proposed for the Contract.
- m) The technical manpower requirement for the project to be provided by the bidder is given as follows.

Sl	Details	Required nos.
1.	<b>Project Engineer-</b> Degree in Civil / Mechanical Engineering having minimum 5 years of relevant experience.	One
2.	<b>Site Engineer-</b> Degree/Diploma in Civil Engineering having minimum 3 years of relevant experience.	One
3.	<b>Electrical Engineer-</b> Degree/Diploma in Electrical Engineering having minimum 5 Years of relevant experience	One
4.	<b>Mechanical Engineer-</b> Degree/Diploma in Mechanical Engineering having minimum 5 Years of relevant experience	One

- n) The bidders shall provide the proposed methodology and program of construction work including Environmental Management Plan backed with equipment, materials and manpower planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.

#### 4. **ONE BID PER BIDDER**

Each bidder shall submit only one bid for one contract.

#### 5. **COST OF BIDDING**

The bidder shall bear all costs associated with the preparation and submission of his Bid and the Employer will in no case be responsible and liable for those costs.

#### 6. **SITE VISIT**

The Bidder, at the Bidder's 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 Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

The number of copies of each section supplied to the prospective Bidder and the number of copies to be completed and returned with the Bid is specified in the Bid Data Sheet.

#### 7. **CLARIFICATION OF BIDDING DOCUMENTS**

A prospective bidder requiring any clarification of the bidding documents may notify the Employer, through e-mail ID [pondysmartcity@gmail.com](mailto:pondysmartcity@gmail.com), before the happening of Pre-bid meeting.

#### 8. **PRE-BID MEETING**

The bidder or his official representative is invited to attend a pre-bid meeting which will take place at the office of PSCDL, at **11.00 hours on 11.02.2021**

The purpose of the meeting will be to clarify issues and to answer questions on any matter related to the Contract work that may be raised at that stage.

Any modification of the bidding documents which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum. The clarifications and amendments if any will be uploaded in the web site <https://pudutenders.gov.in>.

## **9. NON-ATTENDANCE AT THE PRE-BID MEETING**

Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder. Any clarification/request will not be entertained after the pre-bid meeting.

## **10. DOCUMENTS COMPRISING THE BID**

**10.1** The bidders have to prepare their bids online, encrypt their Bid Data in the Bid Forms and submit Bid Seals (Hashes) of all the envelopes and documents related to the Bid required to be uploaded as per the time schedule mentioned in the key dates of the Notice Inviting e-Tenders after signing of the same by the Digital Signature of their authorized representative. The Bid shall comprise three envelopes submitted simultaneously, first envelope (**Envelope A**) shall consist the Document listed in ITB 10.2; Second Envelope (**Envelope B**) called the Technical Bid containing the documents listed in ITB 10.3 and the Third the Financial Bid (**Envelope C**) containing the documents listed in ITB 10.4.

### **10.2 Earnest Money Deposit**

**Envelope A – (Online)** shall contain the following scanned copy of the documents:

- (a) Copy of online EMD payment receipt on bidder's company letter head.
- (b) Proof towards Payment of Tender Document fee.

### **10.3 Technical Bid**

**Envelope B – (Online)** shall contain the following scanned copy of the documents:

- (a) All the forms from I to VIII shall be duly filled up and signed and uploaded.
- (b) Any other document required as per the RFP.

### **10.4 Financial Bid**

**Envelope C- (Online)** as per the format provided in **SCHEDULE – A of RFP**, shall be submitted online.

## **11. BID PRICES**

The contract shall be for the whole works as described in scope of bid, based on the priced Bill of Quantities submitted by the Bidder. The bidder shall fill in rates and prices and line item total (both in figures and words) for all items of the Works described in the Bill of Quantities along with total bid price (both in figures and words). Items for which no rate or price is entered by the bidder will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities.

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

## **12. SECURITY DEPOSIT**

- i. Security Deposit shall be deducted from each running bill @ 5% of bill amount. The total amount of security deposit so deducted shall not exceed the 5% of contract price.
- ii. The Security may be replaced by equivalent amount of bank guarantee or fixed deposit receipt from nationalized/schedule bank assigned to the Employer, with validity up to 3(three) months beyond the completion of defect Liability Period.
- iii. Security deposit will be refunded after 1 year of the defect liability period.

## **13. BID VALIDITY**

Bids shall remain valid for a **period of One hundred and Twenty days (120 days)** after the deadline for technical bid opening specified in **RFP**. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.

In exceptional circumstances, prior to expiry of the original time limit, the Employer 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/mail. A bidder may refuse the request without forfeiting his bid security. Bid evaluation will be based on the bid prices / negotiated price.

## **14. SUBMISSION OF BIDS**

**14.1.** The bidder is required to submit online bid duly signed digitally.

**14.2.** The inner and outer envelopes shall:

Envelope 'A' shall be opened first online at the time and date notified and its contents shall be checked. In cases where Envelope 'A' does not contain all requisite documents, such bid shall be treated as nonresponsive, and Envelope "B" and/or "C" of such bid shall not be opened.

- a. Bear the name and address of the Bidder;
- b. Be addressed to the Employer;
- c. Bear the specific identification of this bidding process (tender ID. NO);

**14.3.** Wherever Envelope 'B' (Technical Bid) is required to be submitted, the same shall be opened online at the time and date notified. The bidder shall have freedom to witness opening of the Envelope 'B'. Envelope 'C' (Financial Bid) of bidders who are not qualified in Technical Bid (Envelope 'B') shall not be opened.

**14.4.** Envelope 'C' (Financial Bid) of the qualified bidders shall be opened online only at the time & date notified. The bidder shall have freedom to witness opening of the Envelope 'C'. After opening Envelope 'C' all responsive bids shall be compared to determine the lowest evaluated bid.

**14.5.** If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid. Employer reserves the right to verify original copies of scanned documents uploaded by bidders. Employer may seek additional documentary evidence on their technical proposals, which the bidders shall provide either online using the e- Procurement or in manual form.

**14.6.** Withdrawal, Substitution and Modification of Bid are not permitted.

**14.7. Procedure for participation in e-Tendering**

- i.** Bidder should do Online Enrolment in this Portal using the option Click Here to Enroll available in the Home Page. Then the Digital Signature enrollment has to be done with the e-token, after logging into the portal.
- ii.** Bidder then logs into the portal giving user id / password chosen during enrollment.
- iii.** The e-token that is registered should be used by the bidder and should not be misused by others.
- iv.** DSC once mapped to an account cannot be remapped to any other account. It can only be inactivated.
- v.** The Bidders can update well in advance, the documents such as certificates, purchase order details etc., under My Documents option and these can be selected as per tender requirements and then attached along with bid documents during bid submission. This will ensure lesser upload of bid documents.
- vi.** After downloading / getting the tender schedules, the Bidder should go through them carefully and then submit the documents as per the tender document; otherwise, the bid will be rejected.
- vii.** The BOQ template must not be modified/ replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for that tender. Bidders are allowed to enter the Bidder Name and Values only.
- viii.** If there are any clarifications, this may be obtained online through the e -Procurement Portal, or through the contact details given in the tender document. Bidder should take into account of the corrigendum published before submitting the bids online.
- ix.** Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender schedule and they should be in PDF/XLS/RAR/DWF formats. If there is more than one document, they can be clubbed together.
- x.** Bidder should arrange for the EMD as specified in the tender. The original should be posted/couriered/given in person to the Tender Inviting Authority, within the bid submission date and time for the tender.
- xi.** The bidder reads the terms and conditions and accepts the same to proceed further to submit the bids
- xii.** The bidder has to submit the tender document(s) online well in advance before the prescribed time to avoid any delay or problem during the bid submission process.
- xiii.** There is no limit on the size of the file uploaded at the server end. However, the upload is decided on the Memory available at the Client System as well as the Network bandwidth available at the client side at that point of time. In order to reduce the file size, bidders are suggested to scan the documents in 75-100 DPI so that the clarity is maintained and also the size of file also gets reduced. This will help in quick uploading even at very low bandwidth speeds.
- xiv.** It is important to note that, the bidder has to click on the Freeze Bid Button, to ensure that he/she completes the Bid Submission Process. Bids which are not Frozen are considered as Incomplete/Invalid bids and are not considered for evaluation purposes.

- xv.** The Tender Inviting Authority (TIA) will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues.
- xvi.** The bidder may submit the bid documents online mode only, through this portal. Offline documents will not be handled through this system.
- xvii.** At the time of freezing the bid, the e-Procurement system will give a successful bid up- dation message after uploading all the bid documents submitted and then a bid summary will be shown with the bid no, date & time of submission of the bid with all other relevant details. The documents submitted by the bidders will be digitally signed using the e-token of the bidder and then submitted.
- xviii.** After the bid submission, the bid summary has to be printed and kept as an acknowledgement as a token of the submission of the bid. The bid summary will act as a proof of bid submission for a tender floated and will also act as an entry point to participate in the bid opening event.
- xix.** Successful bid submission from the system means, the bids as uploaded by the bidder is received and stored in the system. System does not certify for its correctness.
- xx.** The bidder should see that the bid documents submitted should be free from virus and if the documents could not be opened, due to virus, during tender opening, the bid is liable to be rejected
- xxi.** The time that is displayed from the server clock at the top of the tender Portal, will be valid for all actions of requesting bid submission, bid opening etc., in the e-Procurement portal. The Time followed in this portal is as per Indian Standard Time (IST) which is GMT+5:30. The bidders should adhere to this time during bid submission.
- xxii.** All the data being entered by the bidders would be encrypted at the client end, and the software uses PKI encryption techniques to ensure the secrecy of the data. The data entered will not be viewable by unauthorized persons during bid submission and not viewable by any one until the time of bid opening. Overall, the submitted bid documents become readable only after the tender opening by the authorized individual.
- xxiii.** During transmission of bid document, the confidentiality of the bids is maintained since the data is transferred over secured Socket Layer (SSL) with 256 bit encryption technology. Data encryption of sensitive fields is also done.
- xxiv.** The bidders are requested to submit the bids through online e-Procurement system to the Tender Inviting Authority (TIA) well before the bid submission end date and time (as per Server System Clock)

## **15. EVALUATION OF PRICE BIDS**

### **Procedure**

- i.** Envelope 'A' shall be opened first online at the time and date notified and its contents shall be checked. In cases where Envelope 'A' does not contain all requisite documents, such bid shall be treated as nonresponsive, and Envelope "B" and/or "C" of such bid shall not be opened.

- ii. Wherever Envelope 'B' (Technical Bid) is required to be submitted, the same shall be opened online at the time and date notified. The bidder shall have freedom to witness opening of the Envelope 'B'. Envelope 'C' (Financial Bid) of bidders who are not qualified in Technical Bid (Envelope 'B') shall not be opened.
- iii. Envelope 'C' (Financial Bid) of the qualified bidders shall be opened online at the time & date notified. The bidder shall have freedom to witness opening of the Envelope 'C'.
- iv. After opening Envelope 'C' all responsive bids shall be compared to determine the lowest evaluated bid.
- v. The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all the bids at any time prior to contract award, without incurring any liability. In all such cases reasons shall be recorded.
- vi. The Employer reserves the right of accepting the bid for the whole work or for a distinct part of it.
- vii. The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

## **16. AWARD OF CONTRACT**

### **16.1. Employer's Right to Accept Any Bid, and to Reject Any or All Bids**

- i. The Employer may award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
- ii. The employers have right to accept any bid or to reject any or all bids without assigning a reason for that.

### **16.2. Notification of Award**

- i. Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted by issuing a 'Letter of Acceptance' (LOA).
- ii. At the same time, the Employer shall also notify all other Bidders of the results of the bidding. The Employer will not publish the results of the bidding process in any of the newspapers. However, since the process adopted by the employer is online through website (<https://pudutenders.gov.in>), the results identifying the following information;
  - a. name of each Bidder who submitted a Bid;
  - b. bid prices as at bid opening; and
  - c. name of the winning Bidder, and the price it offered
- iii. Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

**16.3. Signing of Contract**

- i. Promptly after acceptance of a tender, the Employer shall send a letter of acceptance (LOA) to the successful Bidder.
- ii. Within Fifteen (15) days of receipt of the letter of acceptance (LOA), the successful Bidder shall sign the agreement, and send it to the Employer.
- iii. The signing of contract agreement shall be reckoned as intimation to commencement of work.

**16.4. Performance security**

- i. All the documents/ information enclosed with the technical proposals should be self-attested and certified by the Bidder. The Bidder shall be liable for forfeiture of his earnest money deposit, if any document/ information are found false/ fake/ untrue before acceptance of Bid. If it is found after acceptance of the Bid, the sanctioning authority may at his discretion forfeit his performance security/ guarantee, security deposit, enlistment deposit and take any other suitable action.
- ii. Prior to signing of the Contract, the bidder to whom LOA has been issued shall have to furnish performance Security @5% of the contract amount in specified form and duration, etc. as specified in the Bid Data Sheet.
- iii. The successful bidder shall have to furnish Performance security and additional performance security, if any, and sign the contract agreement within 15 days of issue of LOA.
- iv. The signing of contract agreement shall be reckoned as intimation to commencement of work. It is not necessary to issue separate work order by the Employer to the contractor for commencement of work.
- v. In the event of failure of the successful bidder to submit Performance Security and additional performance security if any or sign the Contract Agreement within fifteen (15) days of issue of letter of acceptance (LOA), employer may stand forfeited EMD without prejudice to the right of the employer for taking action against the bidder.
- vi. Performance security shall be submitted as per format given in **form- IX**.
- vii. The performance security shall be refunded after completion of agreement period which shall include Construction, Maintenance & operation period.

**17. COMPENSATION FOR DELAY**

- i. The time allowed for the carrying out the work, as entered in the tender form shall be strictly observed by the contractor and shall be deemed to be the essence of the contract and shall be reckoned from the date of signing of the agreement. It is clarified that the need for issue of work order is dispensed with.
- ii. The work shall throughout the stipulated period of contract be proceeded with all due diligence keeping in view that time is the essence of the contract.
- iii. The contractor shall be bound to complete 1/8th of the whole work before 1/4th of the whole time allowed under the contract has elapsed, 3/8th of the work before 1/2 of such time has elapsed and 3/4th of the work before 3/4th of such time elapsed. In the event of the contractor failing to comply with the above conditions, the competent authority shall levy on the contractor as compensation an amount equal to 1/25% of the value of work per week.

- iv. The total amount of compensation under the provision of the clause shall be limited to 5% of the quoted value of work. The decision of the competent authority shall be final. The delay in departmental assistance ingrained in the contract will be taken duly into account while recovering any compensation for the delay in the scales prescribed above. Where the Competent authority decides that the contractor is liable to pay compensation for not giving proportionate progress under this clause and the compensation is recommended during the intermediate period, such compensation shall be kept in deposit and shall be refunded if the contractor subsequently makes up the progress for the last time within the period of the contract including extension granted if any.

## **18. EXTENSION OF TIME**

**18.1.** If the Contractor desires an extension of time for completion of the work on the ground of his having been unavoidably hindered in its execution or on any other grounds, he shall apply, in writing, to the Engineer-in-charge, on account of which he desires such extension. Engineer-in- charge shall forward the aforesaid application to the competent authority as prescribed.

**18.2.** The competent authority may grant such extension at each such occasion within a period of 30 days of receipt of application from contractor and shall not wait for finality of work. If the work is delayed due to contractor's negligence or fault the extensions may be granted in accordance with provisions under section 2 ITB 17.

**18.3.** In case of the work already in progress, the contractor shall proceed with the execution of the works, including maintenance thereof, pending receipt of the decision of the competent authority as aforesaid with all due diligence.

## **19. ACTION BY THE COMPETENT AUTHORITY WHEN THE WORK IS LEFT INCOMPLETE, ABANDONED OR DELAYED BEYOND THE PERMITTED LIMIT**

In any case in which under any clause or clauses of this agreement the contractor shall have rendered himself liable to pay compensation amounting to the performance security and whole of his security deposit (whether paid in one sum or deducted by installments) for:

- i. committed a breach of any of the rules and regulations related to labour laws or,
- ii. in the case of abandonment of the work or ,
- iii. the Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation or,
- iv. the Contractor does not maintain a valid instrument of financial Security, as prescribed or,
- v. If the Contractor fails to deploy machinery and equipment or personnel as specified in the Contract Data or,
- vi. if the Contractor, in judgmental of the engineer in charge has engaged in corrupt or fraudulent practices in competing for or in executing the contract or,
- vii. If the contractor for fails to achieve the mile stone of physical target or financial target.

Except due to permanent disability or death of the contractor, the competent authority on behalf of the Puducherry smart city development limited (PSCDL) shall give a notice before 15 days, and in the event of the contractor failing to comply with the direction contained in the said notice, shall rescind the contract of which rescission notice in writing to the contractor under the hand of the competent authority shall be conclusive evidence and in which case the performance security and the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of Puducherry smart city development limited (PSCDL) and expel the contractor from the site. However, in the case of sub para (III) or (VI) of above clause the competent authority may terminate the contract immediately.

## **20. CORRUPT OR FRAUDULENT PRACTICES**

The Employer requires that Bidders, Suppliers, Contractors, and Consultants observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy, the Employer.

- a) Defines, for the purposes of this provision, the terms set forth below as follows:
  - i. “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution;
  - ii. “Fraudulent practice” means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;
  - iii. “Collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of the employer, designed to establish bid prices at artificial, noncompetitive levels; and
  - iv. “Coercive practice” means harming or threatening to harm, directly or indirectly persons or their property to influence their participation in the procurement process or affect the execution of a contract.
- b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for the Contract in question;
- c) will have the right to require that a provision be included in Bidding Documents and in contracts requiring Bidders, Suppliers, Contractors to permit the Employer to inspect their accounts and records and other documents relating to the bid submission and contract Performance and to have them audited by auditors appointed by the Employer.

## **21. MOBILIZATION AND SECURED ADVANCE**

No mobilization advance will be entertained.

## **22. DEFECT LIABILITY PERIOD**

After completion of two years of Operation and Maintenance period and successful handing over of MLCP facility to PSCDL, one year of Defect Liability Period is applicable. During the duration of DLP, the successful bidder shall attend the defects as and when PSCDL demands the same. The cost of the defective parts required to be replaced during the DLP shall be borne by the successful bidder.

## **SECTION 3**

# **TECHNICAL SPECIFICATIONS**

## **23. TECHNICAL SPECIFICATIONS**

### **I. For Multi-level parking system**

The structure shall be designed in accordance with the latest Indian Standard Codes and

- Shall be designed to resist wind and seismic forces.
- Steel Structures shall be designed in accordance with the provision of IS 800-1984.
- Structural steel shall conform to IS 842. Tubular section shall conform to IS 4923.
- Architectural design norms as per NBC (National Building Code – 2005).
- Structural Design norms as per NBC and BIS (Bureau of Indian Standards)

CONTRACTOR shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural drawings.

The CONTRACTOR shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the CONTRACTOR for the test,

The work shall be carried out in accordance with the Architectural drawings and structural drawings. Before commencement of any item of work, the CONTRACTOR shall correlate all the relevant architectural and structural drawing issued for the work, nomenclature of items, specifications etc. and satisfy himself that the information available there from is complete and unambiguous. The figures & the written dimensions of the drawing shall supersede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in-charge for immediate decision before execution of the work. The CONTRACTOR alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information and no claim, whatsoever shall be entertained on this account.

The CONTRACTOR shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other CONTRACTOR`s) or by the Engineer-in-charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed so as not to interfere with the operations of other CONTRACTOR or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

The rates of different items of work shall apply to all heights & depths unless otherwise specified.

Site Electricians / Other Electrical Personnel: The CONTRACTOR shall engage qualified and competent electricians and other electrical personnel while working for safe execution of contract. The electricians and other electrical personnel must possess requisite certificate issued from competent authority. Using exposed naked loose joints, inserting of bare wire into socket, improper grounding for appliances, exposed circuits on work place etc. shall not be permitted. Rating of fuses and circuit breakers used for protection of circuit should be coordinated. Flexible cords with the conductor cross sectional area smaller than 1.5 mm should not be used. Socket outlets, plugs and cable coupler should be of the water splash proof type, so

minimum IP44 panel boards are required in construction sites. Overhead cabling should provide for a minimum ground clearance of at least 3.0 meters. The CONTRACTOR shall employ qualified, full time Electricians / Electrical Supervisors to maintain his temporary electrical installation. Use approved perimeter markings to isolate restricted areas from designated work areas and entryways. Erect them before work begins and maintain them for the duration of work. Approved perimeter marking must be Install red barrier tape printed with the words 'DANGER-HIGH VOLTAGE' approximately 1 to 1.5 meter above the floor or work surface or Install a barrier of yellow or orange synthetic rope 1 to 1.5 meter from the floor with standard danger signs. Any steps suggested by Engineer-in-charge should be- complied with by the CONTRACTOR.

Welding and Cutting Gas cylinders in use should be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap should be kept in place to protect the valve when the cylinder is not connected for use. Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch Domestic LPG cylinders shall not be used for Gas welding and cutting purpose. DCP or CO2 type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire Extinguisher should confirm to IS 2190: 1992. Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable will not be attached to equipment or existing installations or apparatus.

**a) Steel**

All finished steel shall be well and cleanly rolled to the dimensions and weight specified by BIS subject to permissible to tolerances as per IS: 1852. The finished materials shall be reasonable free from cracks, surface flaws laminations, rough and imperfect edges and all other harmful defects and shall be painted with anti-corrosive paint  
 Steel Sections, shall be free from excessive rust, scaling and pitting and shall be well protected. The decision of the Engineer-in-Charge regarding rejecting any steel section on account of any of the above defects shall be final and binding and shall be painted with anti-corrosive paint.

**a) Fabrication**

Fabrication shall generally be done as specified in IS: 800.

In major works or where so specified, drawings giving complete information for the fabrication of the component parts of the structure including the location, type, size, length and details or fivers, bolts or welds, shall be prepared in advance of the actual fabrication and approved by the Engineer-in-Charge. The drawings shall indicate the shop and field rivets, bolts and welds. The steel members shall be distinctly marked or stenciled with paint with the identification marks as given in the shop drawings.

Great accuracy shall be observed in the fabrication of various members, so that these can be assembled without being unduly packed, strained or forced into position and when built up, shall be true and free from twist, kinks, buckles or open joints.

Wooden or metal sheet templates shall be made to correspond to each member, and position of rivet holes shall be marked accurately on them and holes drilled. The templates shall then be laid on the steel members, and holes for riveting and bolting marked on them. The ends of the steel members shall also be marked for cutting as per required dimensions. The base of steel columns and the positions of anchor bolts shall be carefully set out at the required location.

**c) Erection**

Steel work shall be hoisted and erected in position carefully, without any damage to itself other structures and equipment and injury to workmen. The method of hoisting and erection proposed to be adopted by the CONTRACTOR shall be got approved from the Engineer-in-charge in advance. The CONTRACTOR however shall be fully responsible for the work being carried out in a safe and proper manner without unduly stressing the various members and proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.

**d) Overall Design Parameters**

**i) The codes and standards applicable for the design of the Project / Project facilities are given below:**

Building Works and Electrical System	Road / Pedestrian Path Works
I. Central public works (CPWD)	I. Indian Road Congress (IRC) codes and standards
II. Bureau of Indian Standards (BIS)	II. Relevant Building Byelaws (on Parking Space)
III. National Building Codes (NBC); and	
iv. MPPWD Standards	
IS 456-2000	Plain and reinforced concrete-code of practice
IS 875	Code Of practice for design loads for buildings and structures
Part 1: 1987	dead loads- unit weights of building material and stored material
Part 2: 1987	Imposed loads
Part 3: 1987	Wind loads
IS 1893: 2002	Criteria for earthquake resistant design of structures
IS 13920: 1993	Code of practice for ductile detailing of reinforced concrete structures subjected to seismic forces
IS 800:1984 & 2007	Code of practice for general construction in steel
IS 3370 Part 1 TO 4	Code of practice for liquid retaining structures
IS 2911 Part 1 TO 4	Design & Construction of Pile Foundation
SP-24-2000	Explanatory Hand Book on Indian Standard Code of Practice for Plain and Reinforced Concrete

BS 8110: 1997	Plain and reinforced concrete-code of practice (British standard)
SP-16-2000(Design Aids for Reinforced Concrete)	Design Aids for Reinforced Concrete to IS 456.
SP-34-1987	Hand Book on Concrete Reinforcement and Detailing.
IS 1343:2012	Code of practice for pre-stressed concrete (First Revision)
Soil Report	

**II) Electrical system shall be provided as per the following applicable codes:**

Sl No.	Code No.	Application Details
1	IS-10118 (Part I), 1982	Code of practice for selection, installation and maintenance of switch gear & control gear.
2	IS-732, 1989 Rev.3	Electrical wiring system
3	IS-3043, 1987	Code of practice for earthing
4	IS-13032, 1992(Rev.2)	MCB distribution boards for voltage up to and including 1000V AC
5	IS-12640, 1988	Residual current operated circuit breakers
6	IS-649, 1990 (Rev.-3)	PVC insulated cabled for working voltage up to and including 1100 V AC
7	IS- 9537 (Part-I), 1980	Conduits for electrical installations general requirements
8	IS-13118, 1991	Circuit breakers- general requirements
9	IS-13947 (Part-III), 1993	Air break switches for voltage not exceeding 1000V AC or 1800 V DC
10	IS-1248 (All parts), 1983, 1984, 1993	Electrical direct acting instruments
11	IS-2147, 1962	Degree of protection provided by enclosures for LV switches gear and control gear.
12	National Electrical Code Part-4 Appendix	Recommended values of illumination and limiting values of glare index-Industrial Building (parking space Indoor and outdoor)

Where the aforesaid are silent on any aspect, the following standards in order of preference shall be adopted in consultation with the Engineer-in-charge, unless otherwise specified in this schedule:

- i) Euro norm standards En: 14010: 2003 for parking structure safety.
- ii) American National Standard Institute (ANSI)
- iii) International standards organization (ISO)
- iv) British Standards (BS)
- v) National Fire Protection Association of America (NFPA)
- vi) Safety code of Mechanized Parking (Vertical rotary/Puzzle) garage equipment of America (ASA.A113.1)

- vii) American Society of testing materials (ASTM)
  - viii) International Society for Measurement and Control (ISA)
  - ix) ISO 9000
  - x) Kis & Jis Standards
  - xi) Americans with Disability Act Accessibility Guidelines
  - xii) American Association of State Highway and Transport officials (AASHTO)
  - xiii) American Society of Mechanical Engineers code on storage retrieval (S/R) machines and associated Equipment (ASME B30.13)
  - xiv) National Mechanical code of America (NMC)
1. Any other standard proposed by the Bidder and approved by the Owner /Architect.
  2. The BIDDER shall provide illuminated signage in accordance with NBC/ IRC/ Norms at suitable locations within the parking facility. The scheme for signage shall be finalized in consultation with the independent Engineer.
  3. The Bidder shall provide the fire safety arrangement as per National Building Codes/ DIS codes or any widely accepted international codes.

The above-mentioned specification / codes are indicative only; any other code / specification required for development for parking facility will be applicable even though not mentioned above.

System Specifications of Six Level Six Grid over Ground Four-Wheeler Parking System with Electro Mechanical Technology

Sl.no	Item	Detail Description
1	Model Proposed	Mechanized Parking (Vertical rotary /Puzzle)
2	No. of Levels	Max. permissible height 20 mtr, height of parking as per bidder design keeping provision for SUV type 50 % and Sedan type 50 %
3	Minimum Number of 4-Wheeler Requirement	At old jail site 100 nos./ at Old port site 100 nos.
4	Clear Length of the System	As Per Design
5	Clear Width of the System	As Per Design
6	Allowable Car Dimensions (Length X Height X Width)	As per requirement & specification for SUV & Sedan vehicles
7	Total Allowable Clear Height of the System	As per design
8	Type of System	Electromechanical System
9	No. of Front Columns	As Per Design
10	No. of Rear Columns	As Per Design
11	Load on each Front Column	As Per Design
12	Load on each Rear Column	As Per Design

13	Power rating of the Lifting Motor	As per Design requirement
14	Power rating for Horizontal movement	As per Design requirement
15	Type of Motor	As per Design requirement
16	Type of Pallet	Galvanized Corrugated sheet
17	Type of System	As per Design requirement
18	Wheel Stopper	As per Design requirement
19	Type of Operation	As per Design requirement
20	Safety Devices	
(a)	Photo sensors	As per Design requirement
(b)	Antenna Type Limit Switch	As per Design requirement
(c)	Cam limit Switch	As per Design requirement
(d)	Geared Motor With Brake	As per Design requirement
(e)	Emergency Stop	As per Design requirement
21	Average Retrieval Time per operation	Approx. 120 Sec
22	Operating Panel	Touch screen type
23	Control Panel	PLC
24	Standby power arrangement	Generators
25	Life of system	25 years
26	Noise level	6-75 decibel

**NOTE:** - The above technical specifications described are minimum tender conditions. No deviation will be accepted below the specified specification.

**e) Material Specifications**

Structure	Industrial Grade MS
Guide rail for lifting unit	EN8
Gear boxes & drives	EN24
Delivery unit components	EN Grades
Facade	Aluminum Composite Panel (3 to 4mm tick) + Structural glazing work
Nuts and Bolts	High tensile strength grade
Steel	Special Grade Industrial steel
Motors	German make, Reputed Indian make as per IS Specifications
Lifts	Automatic
Access control	Automatic

**f) HARDWARE, SOFTWARE, FACILITIES**

- i. To provide install necessary complete hardware and software solutions, such as but not limited to boom barriers, auto pay station, devices, port-cabins, switches, gateway, guidance system, for Multi-Level parking (vertical rotary/ Puzzle) system.

- ii. Provide City Level Parking Management Mobile Application and Parking Guidance System to direct users to available parking slots through LED signage also through Smart Parking Mobile Application.
- iii. Provide and install necessary LED signage which also includes variable messages sign board for guidance to public regarding availability of parking spaces other necessary information.
- iv. Create API that can be integrated to the city Integrated Central Control & Command Centre (ICCC) for viewing, analyzing, storing and retrieval of the data to manage the Smart Parking;
- v. Install, operate and maintain an IT system, for parking fee payments, monitoring, and enforcement. Procure software hardware for the processing of customer payments via credit card, net banking, mobile-based banking systems, other media; the impetus is on cashless payment system at all the parking lots.
- vi. Comprehensive operation maintenance of all hardware software installed for this project throughout Operation & maintenance period.
- vii. Procure hardware software to aid in the planning monitoring of enforcement activities.
- viii. To provide install thermal cum optical/IR sensors at each of the parking slot for cars for all surface parking lots. All parking slots should be individually clearly marked mapped with parking sensors and have appropriate camera coverage. All sensors, devices equipment should have the capability to communicate back and forth with the ICCC for information feedback through a RF/ Wi- Fi/GPS or any combination of them in the enabled system
- ix. Establish the required facilities, equipment, information systems for the operations of the Parking System.
- x. The equipment shall not have been put to commercial use anywhere previous to the Commencement of Operations.
- xi. Create and operate an illegal parking management system to inform the concerned authorities.

## **2) Site development works**

### **A. compound and flooring work**

#### **I. Steel grill work for compound and gate**

Supplying and fixing of cast iron grill work comprising of built up tabular section, flats, angles round or square bars and solid designed shapes including fixing in position in masonry walls cement concrete 1:2:4 (cement :2 sand:4 graded stone aggregate 12.5mm nominal size) and in concrete work including cost of casting, molasses casting should conform IS 210gr. and free from crack, blow holes and all other defects grinding turning work etc., to make the surface smooth and to bring to intricate shape as per the design and as directed by the Engineer-in-charges. The work also including finishing the grill with polyurethane MRF colour paint.etc, complete.

#### **II. Brick work**

Brick work with common burnt clay F.P.S. (non modular ) bricks of class designation 35 in foundation and plinth in - cement mortar 1:6 (1 cement : 6 coarse sand).

**III. Plain concrete work**

Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - all work up to plinth level - 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40mm nominal size)

**IV. Reinforcement concrete work**

Providing and laying in position specified grade of reinforced cement concrete, including the cost of centering, shuttering, finishing and reinforcement 1:1.5:3

**V. Flooring**

Providing and laying 20 to 23 mm thick factory made pre-polished cement concrete flooring tiles of required colour and design over 20 mm thick cement mortar 1:4 (1 cement : 4 sand ) and jointed with cement slurry mixed with an admixture of pigment to match the shade of the tile - (Endura \ Ultra \ Dazzle \ Technic)

**VI. Plastering**

12mm cement plaster of mix -1:4 (1cement: 4 fine sand)

**VII. Cornice and architrave work with cement mortar as directed by Engineer-in-charge**

**VIII. Painting work**

Finishing with deluxe multi surface paint system for interiors and exteriors using primer as per manufacture's specification - Two or more coats applied on walls @ 1.25 ltr / 10 sqm over and including one coat of special primer applied @ 0.75 ltr / 10 sqm.

**IX. Quarry rubbish**

Supplying and filling Quarry rubbish including stacking to department gauge for pre-measurement and spreading to required thickness in layers consolidating each deposited layer by ramming and watering etc complete including all lead lift.

**B. Electrical work**

1. Supply and installation of 12.5 mtrs. High mast system with its accessories mast shaft shall be in two sections, hot dip galvanised (as per BS 729 or equivalent) and suitable for wind velocity as per IS 875-1987 (180 km /hour). It shall also include accessories for high mast including head frame, stainless steel wire rope 6mm dia (7/19 construction) double drum per winch , which galvanized lantern carriage arrangement suitable for 10 (ten) luminaries symmetrically and its motorized control gear boxes and lighting final. (as per detailed technical specification as shown in annexure - I) the work also includes laying of Reinforced cement concrete foundation of size 0.60 x 0.60 x 1.80 m in 1:2:4 (1 cement: 2 sand: 4 graded stone aggregate 20mm nominal size with adequate reinforcement, centering, shuttering as directed by Engineer-in-charge)

2. Supply and fixing of LED outdoor flood light fitting in Highmast/ Minimast having 140 watts to 160 watts (system wattage), IP 65/66, white colour with necessary over voltage, under voltage and surge protection with three years onsite warranty for replacement/ rectification. Make: Philips/ Havells/ Crompton/ Bajaj/ LEDGEO/ Eveready. The rate is inclusive of all taxes.
3. Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground including excavation , sand cushioning, protective covering and refilling the trench etc.as required - Upto 35 sq.mm
4. Wiring for circuit / sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor , single core cable in surface / recessed medium class PVC conduit as required - 4 X 16 sq.mm + 2 x 6 sq.mm earth wire
5. Supplying and making end termination with brass compression gland and aluminum lugs for following size of PVC insulated and PVC sheathed / XLPE aluminum conductor cable of 1.1kV grade as required - 4 X16 sq.mm (28 mm)
6. Supply, erection, testing and commissioning of one no of SMC Box. (make: Sintex) with metering and timer panel board for the power supply to overall size 850mmx350mmx250mm made out of Glass wool with resin material. The front side top portion have energy meter with viewing glass with 10mm hylem sheet. The bottom side compartments with 40-63A rating, TPN MCB,C' series 10KA breaking capacity (make- Siemens/ABB),1no of timer switch (daily) aong with battery backup 200hrs (make-L&T-kagger/legarand-lexic) 1no.60A power conductor (make-C&S/L&T),1no of toggle switch (make –C&S). The switch units are to be fixed within the allotted size in the 10 mm hylem sheet. The bottom sheet of the shell should be of PVC thick roll sheet for cable entry. The panel has to be mounted 75mm x75mm 6mm MS'L angle on the floor with in the height of 600mm interior connection between the switch fuse units are to be done with 2.5/6.0/10.0 sq.mm ISI marked, FR PVC insulated, single core copper conductor cable. (Make-Finolex/Polycab).  
The door should be flush type inter locking in one position. The panel provided with removable type pland plated to the bottom and with sufficient holes of required diameter. Earth work excavation of foundation trench of size 1.00mm x 06mm x 0.6m and fitting river sand for depth of 0.10m and P.C.C 1:2:4(1 cement:2 coarse sand: 4 graded stone aggregate of 20mm nominal size) of size 1.00mm x 0.60 x 1.00m. The cost should be inclusive of minor modification suitable for site condition as approved by the Engineer-in-charge.

## **24. DETAILS OF PAYMENT SCHEDULE**

The Chief Executive Officer of ISCDL shall have full powers to fix interim rates within the components. In case of any deviation/alternations/modifications of methodology leading to change in components or its quantity or incorporation of new items of work, the Chief Executive Officer shall have full powers to revise the breakup components keeping the contract price same as quoted by the bidder.

#### 24.1 PAYMENT SCHEDULE FOR MULTI LEVEL CAR PARKING

Surveying, planning, investigation, sub-soil exploration, fixing layout, designing, drawing, and supply, installation, erection and commissioning of Mechanized multilevel Smart parking for minimum 140 Nos. of Four-Wheeler Parking. Smart parking system and LED signage at different location of parking to guide visitor with other amenities, such as construction of Ticket counters, Control Room, Male and female toilets, Firefighting system arrangements, all electrification and plumbing work, Ventilation, Civil and finishing works.

a. Upon receiving a report from the Engineer in Charge certifying the achievement of the below mentioned Payment Milestones.

b. The payment shall be payable as per the Payment Milestone given below during Construction Period shall be as under:

Sl. no	Stages of Work	percentage of "bid amount"
1	After survey, investigation, layout, design-drawing, etc. for Fabrication, erection and commissioning of Mechanized multilevel Smart parking solution for minimum 100 Nos. of Four-Wheeler Parking with smart solution. Ticket counters, Control Room, Firefighting system arrangements, all electrification and plumbing work, Ventilation, Civil and finishing works etc. for design drawing	2.5 %
2	After completion of foundation and substructure as per the approval design and drawings	15 %
3	After Construction, Completion of Fabrication/Manufacturing/Erection, supplying of materials of Mechanized multilevel Smart parking for minimum 100 Nos. Parking. Running Bills will be paid as detailed below :-	65 %
	I 15% on delivery & installation of structural work at site of each module on prorata basis.	
	II 15% on delivery & installation of drive assembly and pallets of each module on prorata basis.	
	III 10% on delivery & installation of electrical spares and control panel of each module on prorata basis	
	IV 15% on Commissioning and handing over of the Car Parking Module on prorata basis.	
	V 10% for providing & commissioning of software / hardware components with LED signage, Smart Parking solutions etc.,	
4	After Construction of Ticket counters, Control Room, Firefighting system arrangements, all electrification and plumbing work, Ventilation, Facade, Civil and finishing works and other miscellaneous works as per approved design-drawing, specifications of relevant I.S. Codes and circulars issued by the Department from time to time.	5 %
5	After successful Operation and Maintenance – 1st Year	5 %
6	After successful Operation and Maintenance – 2nd Year	7.5 %
	<b>Total</b>	100 %

Note: 5% of the payment shall be deducted for security deposit on each payment and will be released after one year of defective liability period which commences from the expiry of 2 years Operation and Maintenance period and after successful transfer of the facility to Puducherry Smart City Development Ltd.

- c.** Provided that in case of Change of Scope, the Physical Progress shall be recalculated to account for the changed scope.
- d.** In case, there is a delay in achieving the Milestone, the payment shall be made on prorated basis of the particular milestone.

**24.2 For Civil / Electrical infrastructure work payment will be made as per actual measurement for finished item.**

## **SECTION 4**

### **BILL OF QUANTITIES**

### SCHEDULE – A

## DESIGN, DEVELOP, IMPLEMENT, OPERATE, MAINTAIN AND TRANSFER MULTI-LEVEL FOUR-WHEELER MECHANIZED PARKING AT OLD JAIL COMPLEX IN JN STREET & OLD PORT COMPLEX IN PUDUCHERRY

Sl. No	DESCRIPTION OF WORK	QTY	RATE		UNIT	AMOUNT
			In figures	In words		
1	Supply, installation, erection, testing & commissioning & two Year Comprehensive Operation and maintenance contract of Parking System with Electro Mechanical technology to accommodate minimum 100 Nos. of four-wheeler with suitable steel structure frame work, Independent motorized pallet having up/down movement with electro-mechanical technology complete with PLC and electrical installation etc. as per specification and direction of Puducherry Smart City Development Ltd. The system shall be designed to accommodate 50% SUV's cars and 50% Sedan cars with average retrieval/parking time not more than 180 seconds. The rate is inclusive of required foundations and details explained in <b>Scope of bid in section 2.1 to 2.21 of RFP.</b> <b>i. Old jail complex (for 100 Equivalent car spaces)</b>	100			ECS	
2	Supply, installation, erection, testing & commissioning & two Year Comprehensive Operation and maintenance contract of Parking System with Electro Mechanical technology to accommodate minimum 100 Nos. of four-wheeler with suitable steel structure frame work, Independent motorized pallet having up/down movement with electro-mechanical technology complete with PLC and electrical installation etc. as per specification and direction of Puducherry Smart City Development Ltd. The system shall be designed to accommodate 50% SUV's cars and 50% Sedan cars with average retrieval/parking time not more than 180 seconds. The rate is inclusive of required foundations and details explained in <b>Scope of bid in section 2.1 to 2.21 of RFP.</b> <b>ii. Old port complex (for 100 Equivalent car spaces)</b>	100			ECS	

SL.	DESCRIPTION OF WORK	QTY	RATE		UNIT	AMOUNT
3	Construction of compound wall in brick work with cast iron grills work as per <b>Drawing 1 in RFP.</b>	110			Mtr	
4	Construction of reinforced cement concrete pillar finished with cornices and architraves and supplying and fixing cast iron grill gate as per <b>Drawing 2 in RFP.</b>	34			Sq.mtr	
5	Providing and laying cement concrete kerbs, steps and the like at or near ground level including the cost of centering, shuttering in 1:2:4 (1cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) the rate inclusive of plastering the kerbs with 12 mm thick 1:4 cement mortar and painting with cement primer and enamel paint as per <b>Drawing 3 in RFP.</b>	400			Mtr	
6	Providing and laying 20 to 23 mm thick factory made pre-polished cement concrete flooring tiles of required colour and design, over 20 mm thick cement mortar 1:4 (1 cement : 4 sand ) and jointed with cement slurry mixed with an admixture of pigment to match the shade of the tile - (Endura \ Ultra \ Dazzle \ Technic) the base course for flooring is provided with plain cement concrete 1:5:10 (1cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) of 125mm thick below which the surface is stabilized with quarry rubbish for an average of thickness of 250mm as per <b>Drawing 3 in RFP.</b>	2,700			Sq.mtr	
7	Supply and installation of 12.5 mtrs. High mast system with its accessories mast shaft shall be in two sections, hot dip galvanised (as per BS 729 or equivalent) and suitable for wind velocity as per IS 875-1987 (180 km /hour). It shall also include accessories for high mast including head frame, stainless steel wire rope 6mm dia (7/19 construction) double drum per winch , which galvanized lantern carriage arrangement suitable for 10 (ten) luminaries symmetrically and its motorized control gear boxes and lighting final. (as per detailed technical specification as shown in <b>annexure - II</b> ) the work also includes laying of Reinforced cement concrete foundation of size 0.60 x 0.60 x 1.80 m in 1:2:4 (1 cement: 2 sand: 4 graded stone aggregate 20mm nominal size with adequate reinforcement, centering, shuttering as directed by Engineer-in-charge)	6			Each	

SL.	DESCRIPTION OF WORK	QTY	RATE		UNIT	AMOUNT
8	Supply and fixing of LED outdoor flood light fitting in Highmast/ Minimast having 140 watts to 160 watts (system wattage), IP 65/66, white colour with necessary over voltage, under voltage and surge protection with three years onsite warranty for replacement/ rectification. Make: Philips/ Havells/ Crompton/ Bajaj/ LEDGEO/ Eveready. The rate is inclusive of all taxes.	36			Each	
9	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground including excavation , sand cushioning, protective covering and refilling the trench etc.as required - Upto 35 sq.mm	250			Mtr	
10	Wiring for circuit / sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor , single core cable in surface / recessed medium class PVC conduit as required - 4 X 16 sq.mm + 2 x 6 sq.mm earth wire	100			Mtr	
11	Supplying and making end termination with brass compression gland and aluminum lugs for following size of PVC insulated and PVC sheathed / XLPE aluminum conductor cable of 1.1kV grade as required - 4 X16 sq.mm (28 mm)	6			Each	
11	Supply, erection, testing and commissioning of one no of SMC Box. (make: Sintex) with metering and timer panel board for the power supply to overall size 850mmx350mmx250mm made out of Glass wool with resin material. The front side top portion have energy meter with viewing glass with 10mm hylem sheet. The bottom side compartments with 40-63A rating, TPN MCB,C' series 10KA breaking capacity (make- Siemens/ABB),1no of timer switch (daily) aong with battery backup 200hrs (make-L&T-kagger/legarand-lexic) 1no.60A power conductor (make-C&S/L&T),1no of toggle switch (make –C&S). The switch units are to be fixed within the allotted size in the 10 mm hylem sheet. The bottom sheet of the shell should be of PVC thick roll sheet for cable entry. The panel has to be mounted 75mm x75mm 6mm MS'L angle on the floor with in the height of 600mm interior connection between the switch fuse units are to be done with 2.5/6.0/10.0 sq.mm ISI marked, FR PVC insulated, single core copper conductor cable. (Make-Finolex/Polycab). The door should be flush type inter locking in one position. The panel provided with	2			Each	

Sl.	DESCRIPTION OF WORK	QTY	RATE		UNIT	AMOUNT
	removable type pland plated to the bottom and with sufficient holes of required diameter. Earth work excavation of foundation trench of size 1.00mm x 06mm x 0.6m and fitting river sand for depth of 0.10m and P.C.C 1:2:4(1 cement:2 coarse sand: 4 graded stone aggregate of 20mm nominal size) of size 1.00mm x 0.60 x 1.00m. The cost should be inclusive of minor modification suitable for site condition as approved by the Engineer-in-charge.					

**CHIEF EXECUTIVE OFFICER**  
**PSCDL**

## **SECTION 5**

### **FORMS OF BID**

**From –I**  
**LETTER OF TENDERER**

To,  
**The Chief Executive Officer,**  
Puducherry Smart City Development Limited,  
No.2. Bussy Street,  
Old court building,  
Puducherry- 605 001.

Sir,

Sub: Submission of Bid for Design, Develop, Implement, Operate, Maintain and Transfer Multi-Level Four-Wheeler Mechanized Parking (Vertical rotary/Puzzle) at Old Jail Complex in JN Street & Old Port Complex in Puducherry.

- a. I / We .....having examined the details given in the Invitation to Bidders, we hereby submit the following information and relevant documents.
- b. I/We hereby certify that all the statements, information and data provided in the enclosed forms and accompanying sheets are true and correct to the best of my / our knowledge.
- c. I/We ..... have read the instructions appended with the qualification document and I/We understand that any contract made between ourselves and **The Chief Executive Officer, PSCDL, Puducherry**, on the basis of the information given by me / us is liable to be cancelled if any false information is detected at a later date.
- d. I/We .....have also no objection if enquiries are made on all the projects and works listed by me / us in the accompanying sheets or any other enquiry on the information furnished herewith in the accompanying sheets.
- e. I/We have furnished all information and details as asked for and have no further pertinent information to provide.
- f. I/We submit in **from** the certificates in support of my / our suitability, technical know-how and capability for having successfully completed the works during the last five years.
- g. I/We also agree that the decision of **The Chief Executive Officer, PSCDL, Puducherry**, in the Qualification and selection of Contractors will be final and binding upon me / us.
- h. I/We agree that **The Chief Executive Officer, PSCDL, Puducherry**, reserves the right to qualify any contractor or to cancel the exercise without assigning any reason for doing so or to incur any liability to any party whatsoever.

- i. I/We agree not to withdraw from the contract after issue of LOA and before signing the agreement. If so we abide by the condition that liquidated damages shall be claimed against us by “**The Chief Executive Officer, PSCDL, Puducherry,**”
- j. The following are enclosed as enclosures to the letter of tender:
1. Certificate of Incorporation from Registrar of Companies.
  2. Memorandum of Association
  3. Annual Report / Audited Balance Sheet & Profit and Loss Statement for the last 3 years Proof of filing Income Tax returns for the past three years.
  4. Sales Tax / Works Contract Tax / GST / Service Tax / PAN Registration and Clearance certificate.
  5. PERT/BAR Charts and quality Formats used at site such as pour card for Concrete etc.
  6. Testimonials from Clients/Consultants for completion of works included in **form-V**.
  7. LOI / Work Order issued by the Clients for ongoing works included in **form – VI**.
  8. Organization Chart of Company showing the Officer in-Charge who will have direct link with and control of, site organization.
  9. Organization Chart and Curriculum Vitae of top two officers, viz, Project Manager and coordinator.
  10. Method Statement : Programming & Planning and Progress monitoring plan, weekly and monthly ; Management of direct subcontractors from selection through execution of work; Coordination with Specialist contractors etc.; Quality Control & Quality Assurance at site; Safety Plan; and
  11. **Form II to VIII** with complete details and any certificates other than that listed above.

I / we hereby agree to abide by the decisions **The Chief Executive Officer, PSCDL, Puducherry,** in all matters relating to this Qualification.

Date of Submission

Signature of Bidder with Official Seal

**Form –II**

**ORGANISATION STRUCTURE (BIDDER)**

Sl. No.	Details required	To be filled by the Bidder	Page Ref.
1	Name of the Bidder's Company		
2	Nationality of Bidder		
3	Establishment of the Company		
	i) Year		
	ii) Location		
4.	The Bidder is a company (Please enclose attested copy of registration incorporation under appropriate laws of the Bidder's Country)	Yes / No Enclosed / Not enclosed	
5	Address of the Bidder :		
i)	Registered Office Address		
	Telephone Number		
	Fax Number		
	E-mail Address		
	Web site		
ii)	Local office address:		
	Telephone Number		
	Fax Number		
	E-mail Address		
iii)	Office address through which this work will be handled and name of officer in-charge.		
	Telephone Number		
	Fax Number		
	E-mail Address		
6	The Bidder has to furnish a detailed note on how it will handle the project in India, if successful bidder, in terms of (i) Finance, (ii) Manpower,(iii) Tools & equipment, (iv) Use of local agencies and labour, (v) Project control and management plan		
7	Details of the Board of Directors		
	i) Name of the Director		
	ii) Qualification		
	iii) Organization		
	iv) Office address		
	v) Telephone Number		
	vi) Fax Number		
	vii) E-mail Address		
8	Enclose Company's Organization Chart showing the structure of the organisation including the names of the Directors / Chief Executive Officer and position of Officers.	Enclosed / Not Enclosed	

9	Number of years of experience and other Details.		
a	As a Principal Contractor (Contractor shouldering major responsibility)	Yes / No	
	i. In INDIA	Yes / No No. of Years :	
	ii. Other countries (If yes, pl. specify country)	Yes / No No. of Years : Country :	
10	Average number of permanent employees in the last 12 months.		
	i) Managerial	Nos.	
	ii) Technical	Nos.	
	iii) Administration	Nos.	
	iv) Financial	Nos.	
	v) Quality Control and Quality Assurance Engineer	Nos.	
	vi) Safety Officer	Nos.	
	vii) Public Relations Officer	Nos.	
	viii) Supervisors	Nos.	
	ix) Foreman / Technician	Nos.	
	x) Skilled Labours	Nos.	
	xi) Unskilled Labours	Nos.	
	xiii) Others (to specify)	1. Nos. 2. Nos. 3. Nos.	
11	i) How many years has your Company been in business of similar work under its present name & address	.....Years	
	ii) What were your fields of activities from when your Company was established?	1. 2. 3.	
	iii) Whether any new fields were added in your Company? and if so, when and in what fields?	1. 2. 3.	
12	Area of business activities other than construction works, if any (If yes, please furnish specific information).	Yes / No	
13	In which fields of Engineering works do you claim specialization and interest?	1. 2. 3.	
14	Whether registered with any Government / Public Sector Undertaking / Urban Local bodies like CPWD / MES / PWD or equivalent. If yes, please furnish details class and type of Registration.	Yes / No 1. 2. 3.	
15	Registration Details :		
	i) Sales Tax Registration No or equivalent applicable in the Bidder's country & Valid upto		
	ii) PF Registration No or equivalent applicable in the Bidder's country & Valid upto		
	iii) ESI Registration No or equivalent applicable in the Bidder's country & Valid upto		
	iv) Service Tax registration No or equivalent applicable in the Bidder's country & Valid upto		

16	Whether adequate and satisfactory evidence to indicate financial capacity of the organisation to undertake the said construction work is enclosed.	Yes / No	
17	Do you have plans for sub-contracting any part of the work. If yes, specify the quantum of contract in terms of percentage of works. Details of credentials of the subcontractors proving their ability to handle the component of this project.	Yes / No  %  Rs.....	
18	Maximum Quantities executed in a single day in any one year in the last five years in respect of the following items of work (Information only) mention the project name and cost.		
	i) - a) Plain Cement Concrete works	Cum	
	b) Reinforced Cement Concrete works	Cum	
	ii) Reinforcement steel	MT	
	iii) Rainwater Harvesting Structures	Nos.	
19	Do you have in-house Soil and Material testing laboratory Facility?	Yes / No	
20	Do you have Latest Survey instruments and Equipment to set out levels at any heights and all type of Special structures?	Yes / No If yes mention the name of equipment and the quantity possess.	
21	Do you have your own Ready mix concrete facility?  If yes, give details of location and its production capability in terms of quantity per day.	Yes / No  Location Production Cum/Day	
22	Do you have your own Cement manufacturing Plant / Ready mix plant? If yes, furnish details of your own plant. If no, please specify name of manufacturer for sourcing and the dependency of the manufacture by the Bidder.	Yes / No	
23	Do you have R&D department ? If yes, give details.	Yes / No	
24	i) Do you have and adopt Quality Control and Quality Assurance Manual?	Yes / No Enclose QA Plan	
	ii) Is your company an ISO certified Company? If yes, furnish the ISO certification no.	Yes / No	
	iii) Do you follow Quality Assurance System as per the appropriate ISO series of standards?	Yes / No	
25	i) Do you have and follow Safety Manual?  If yes, give details of health and safety facilities available with you.	Yes / No  Enclose Environmental Health and Safety Plan.	
	ii) Was there any major, fatal accident during execution in the last five years? If yes, furnish	Yes / No	
	iii) Whether corrective action taken immediately and first-aid facilities provided in the site?	Yes / No	
26	<b>Proposed Methodology:</b>	Enclose Statement	
	i) Whether the Programming and planning plan will be prepared in the form of PERT Chart or Bar Chart?	Yes / No	

	ii) Whether the coordination plan & report plan will be prepared in the standard format?	Yes / No	
	iii) Whether the technically qualified Sub-Contractors/Consortium members are engaged to carry out the work?	Yes / No	
27	Were you ever required to suspend work for a period of more than three months continuously after you started the work? If yes, furnish the name of project and reasons thereof.	Yes / No 1. Name of Project : Reasons 2. Name of Project : Reasons	
28	Have you ever left the work awarded to you incomplete? If yes, furnish the name of project and reasons thereof.	Yes / No 1. Name of Project : Reasons 2. Name of Project : Reasons	
29	Were any penalties imposed for delays on the completion of the project? If yes, furnish the name of project and reasons thereof.	Yes / No 1. Name of Project : Reasons 2. Name of Project : Reasons	
30	Were there any terminations of Contracts by the Employer? If yes, furnish the details.	Yes / No 1. Name of Project : Reasons 2. Name of Project : Reasons	
31	Litigation initiated by the Company and against the Company if any?		
	i) Whether cases of litigation proceedings have arisen in your projects during the last three financial years?	Yes / No	
	ii) If Yes, How many cases of litigation arisen during the last three financial years?	Nos.	
	iii) Furnish the details of the highest claim of Litigation during the last three financial years.	Rs.	
	iv) If the Bidder is a multinational company, please furnish the litigation history initiated by the Company and against the company in India, if any.		
32	Arbitration :		
	i) Whether cases of arbitration proceedings have arisen in your projects during the last three years?	Yes / No	
	ii) If Yes, How many cases of arbitration arisen during the last three years. Furnish name of work, name of the Client, cost of work, amount of claim.	Nos.	
	iii) Furnish the details of the highest claim of arbitration during the last three years.	Rs.	

33	Details of the Banker		
	Name of the Banker		
	Contact person		
	Office Address		
	Telephone Number		
	Fax Number		
34	Are you a Recipient of any Award in appreciation of your work? If yes, furnish the details	Yes / No	
35	Please give at least three references of Clients (Engineers, Architects or Top Officials of Organisation) for whom you may have executed construction works of importance and similar nature from whom “The Chief Executive Officer, PSCDL,” and can verify.	1.Name: Designation: Company:  2.Name: Designation: Company:  3.Name: Designation: Company:	
36	Any special information, which you may like to provide.		

Place:

Date:

Signature of the Bidder  
Common seal of the Company

From –III

**PERSONNEL TO BE DEPLOYED FOR THE PROJECT**

S.No.	Details required	To be filled by Bidder
<b>A</b>	<b>Project Engineer</b>	
1	Individual's Name	
2	Age	
3	Qualification	
4	Present position	
5	Professional experience in the similar nature of works.	
6	Years with the Bidder	
7	Language known	
8	Name two recent works and nature of involvement of the person	
<b>B</b>	<b>Site Engineer</b>	
1	Individual's Name	
2	Age	
3	Qualification	
4	Present position	
5	Professional experience in the similar nature of works.	
6	Years with the Bidder	
7	Language known	
8	Name two recent works and nature of involvement of the person	
<b>C</b>	<b>Electrical Engineer</b>	
1	Individual's Name	
2	Age	
3	Qualification	
4	Present position	
5	Professional experience in the similar nature of works.	
6	Years with the Bidder	
7	Language known	
8	Name two recent works and nature of involvement of the person	

<b>D</b>	<b>Mechanical Engineer</b>	
1	Individual's Name	
2	Age	
3	Qualification	
4	Present position	
5	Professional experience in the similar nature of works.	
6	Years with the Bidder	
7	Language known	
8	Name two recent works and nature of involvement of the person	

Place:

Signature of the Bidder

Date:

Common seal of the Company

Note: 1) CV of each of the above key personnel and details of their experience should be included in the submission.

2) Organization Chart (both office and site) specific for this project for all the divisions of work (Main works & Direct Sub works) as an Annexure to this format must be attached.

**Form –IV**  
**Financial Information**

Sl.No	Description	Details to be filled in by Bidder
<b>A.</b>	<b>Annual Turnover in the last three financial years (In lakhs )</b>	
i	Year : April 2017 to March 2018	
ii	Year : April 2018 to March 2019	
iii	Year : April 2019 to March 2020	
<b>B</b>	<b>Financial Information (In lakhs)</b>	
<b>I</b>	Year : April 2017 to March 2018	
	a. Total assets	
	b. Current assets	
	c. Total Liabilities	
	d. Current Liabilities	
	e. Profits before taxes	
	f. Profits after taxes	
	g. Net worth	
	h. Working Capital	
<b>II</b>	Year : April 2018 to March 2019	
	a. Total assets	
	b. Current assets	
	c. Total Liabilities	
	d. Current Liabilities	
	e. Profits before taxes	
	f. Profits after taxes	
	g. Net worth	
	h. Working Capital	
<b>III</b>	Year : April 2019 to March 2020	
	a. Total assets	
	b. Current assets	
	c. Total Liabilities	
	d. Current Liabilities	
	e. Profits before taxes	
	f. Profits after taxes	
	g. Net worth	
	h. Working Capital	

C	Credit facilities available to Bidder – Fund and non-fund based such as Cash Credit, Working capital term loans, LCs and Bank Guarantees - Banker's or Bankers' Letter must be produced. (Rs.in lakhs).	
	a. Name of Banker with address	
	b. Date of Letter of Support	
	c. Amount	
D	Bidder's Financial resources for this project	
	a. Own resources	
	b. Banker's or Bankers' credits	
E	a. Approximate total value of on-going works	
	b. Total Value of works to be completed as of now.  Note: 1) The Bidder should furnish the value of work to be completed as of now along with break-up 2) The Bidder has to ensure that the list of works covered in this Proforma should be same as the ones listed in Proforma - VII (List & details of Ongoing works) with Proforma of each work.	
F	Anticipated total value of new works for the next financial year.	

Place:

Signature of the Bidder

Date:

Official Seal

Note: Balance sheet, Profit and loss statement, auditor's report etc. duly signed by Chartered Accountant is required to be attached separately.

**Form –V**

**Details of completed similar works**

S.No.	Details required	To be filled by the Bidder
1	Name of work	
2	Country and location	
3	Client's name and address	Name:  Address :
4	Consultants name and address.	Name:  Address :
5	Total tendered cost of work Agreement No. Date	Lakhs Agreement No: Date :
6	Total actual cost of work after completion	Lakhs
7	Excess / less in percentage.	%
8	Explain, if Excess / less is higher by 20% of the tendered cost of work.	
9	Date of commencement	
10	Period of completion	
11	Stipulated date of completion	
12	Actual date of completion	
13	Extended by the contractor, if any. Reason for non- completion of work in stipulated time limit / extended time limit, if so furnish details	Yes / No
14	Extension of time granted by the Client, if any. If yes, please specify the reason for extension of time.	Yes / No
15	Brief description of works including principal features and quantities of main items of the work.	
16	Name of Contractor's Engineer in-charge of the Project & Qualifications	Name :  Qualification:
17	Details of specialized work executed under this Contract.	
18	Details of specialized work executed by their own divisions under the Contract	
20	Whether the Programming and planning plan was followed in the form of Pert Chart or Bar Chart?	Yes / No
21	Whether the Quality Control and Quality Assurance function was carried out? If yes, Please give details and copies of quality formats used in any one project.	Yes / No

22	Whether the safety measures were followed? If yes, Please give details.	Yes / No
23	Were there any penalties / fines / stop notice / compensation / liquidated damages imposed during execution of the project? If Yes, Please give amount, details and reason.	Yes / No Amount: Reason:
24	Whether the contract of the work was terminated? If Yes, furnish the details.	Yes / No Name of the Project: Reason:
25	Please specify the details of litigation / arbitration cases, if any, pertaining to works completed. If Yes, furnish the details i.e. Nature of litigation / arbitration. Please furnish whether the litigation is initiated by the Company or against the Company.	Yes / No
26	Attach client's certificate, as may be available (Not below the rank of Director or equivalent)	Yes / No

Place:

Date:

Signature of the Bidder  
Official Seal

**Form–VI**  
**Details of On-Going works**

Sl.No.	Details required	To Be filled by the Bidder
1	Name of work	
2	Country and location	
3	Client's name and address	Name: Address :
4	Consultants name and address	Name : Address :
5	Total tendered cost of work (Agreement No. and Date)	Lakhs
6	(a) Brief description of works including principal features and quantities of main items of the work.	
7	i) Percentage of physical completion	
	ii) Amount billed for the work completed.	
	iii) Cost of work remaining to be executed as on the date of submission.	
	iv) Stipulated date of completion	
	v) Anticipated date of completion	
8	Name of Contractor's Engineer in-charge of the Project & Qualifications.	Name : Qualification :
9	Details of specialised works under this Contract	
10	Specialised works being executed by their own divisions	
11	Details of the sub-contracted specialised works by the Bidder	
	i) Total value of work sub-contracted.	Lakhs
	ii) Trade-wise value of work sub-contracted.	1 Lakhs 2 Lakhs
	iii) Trade-wise Name of sub-contractors Use separate sheet for details of such sub-contractors experience, capability, testimonial.	1. 2. 3. 4.
12	Attach client's certificate, as may be available (Not below the rank of Director or equivalent)	Yes / No

Place:

Date:

Signature of the Bidder  
Official Seal

**Form-VII**

**Power of Attorney for Lead Member of Consortium**

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 2021

Know all persons by these present that We, \_\_\_\_\_ and \_\_\_\_\_ (hereinafter collectively referred to “the consortium / joint venture”) hereby appoint and authorize \_\_\_\_\_ as our attorney.

Whereas the PSCDL has invited applications from interested parties for Design, Develop, Implement, Operate, Maintain and Transfer Multi-Level Four-Wheeler Mechanized Parking (Vertical rotary/Puzzle) at Old Jail Complex in JN Street & Old Port Complex in Puducherry.

Whereas the members of the consortium/joint venture are interested in bidding for this project in accordance with the terms and conditions of this tender along with its amendments, addenda and related documents,

And whereas it is necessary for the members of the consortium/joint venture to appoint and authorize one of them to do all acts, deeds and things in connection with the aforesaid Project,

We hereby nominate and authorize \_\_\_\_\_ as our constituted attorney in our name and on our behalf to do or execute all or any of the acts or things in connection with making an application to PSCDL to follow up with PSCDL and thereafter to do all acts, deeds and things on our behalf until culmination of the process of bidding and thereafter till the license agreement is entered into with the successful bidder.

And we hereby agree that all acts, deeds and things done by our said attorney shall be construed as acts, deeds and things done by us and we undertake to ratify and confirm all and whatsoever that our said attorney shall do or cause to be done for us by virtue of the power hereby given.

All the members of this consortium will be jointly and severally liable for execution of this assignment in all respects.

In witness hereof we have signed this deed on this \_\_\_\_\_ day of \_\_\_\_\_ 2021.

[Signature]

For and on behalf of

[Company]

[Signature]

For and on behalf of

[Company]

**Note:** The above **Power of Attorney** should be furnished in Non Judicial Stamp Paper, not less than Rupees One Hundred.

**Form–VIII**  
**Memorandum of Understanding**

Know all men by these present that we, \_\_\_\_\_ and \_\_\_\_\_ (herein after collectively referred to “the consortium / joint venture”) for execution of tender.

Whereas the PSCDL has invited tenders from the interested parties for Design, Develop, Implement, Operate, Maintain and Transfer Multi-Level Four-Wheeler Mechanized Parking (Vertical rotary/Puzzle) at Old Jail Complex in JN Street & Old Port Complex in Puducherry.

Whereas the members of the consortium / joint venture are interested in bidding for the work of \_\_ in accordance with the terms and conditions of the RFP/tender.

This Consortium / Joint Venture agreement is executed to undertake the work and role and responsibility of the firms as \_\_\_\_\_.

And whereas it is necessary under the conditions of the RFP/tender for the members of the consortium / joint venture to appoint and authorize one of them as Lead Member to do all acts, deeds and things in connection with the aforesaid tender \_\_\_\_\_ is the Lead Member of the Consortium.

We hereby nominate and authorize \_\_\_\_\_ as our constituted attorney in our name and on our behalf to do or executive all or any of the acts or things in connection with the execution of this Tender and thereafter to do all acts, deeds and things on our behalf and thereafter till the satisfactory completion of work.

And we hereby agree that all acts, deeds and things done by our said attorney shall be construed as acts, deeds and things done by us and we undertake to ratify and confirm all and whatsoever that my said attorney shall do or cause to be done for us by virtue of the power hereby given. All the members of this consortium will be jointly and severally liable for execution of this assignment in all respects. In witness hereof we have signed this deed on this \_\_\_\_\_ day of \_\_\_\_\_. [Signature]

By the with named \_\_\_\_\_ through its duly constituted attorneys in the presence of \_\_\_\_\_. [Signature]

By the with named \_\_\_\_\_ through its duly constituted attorneys in the presence of \_\_\_\_\_.

**Notes**

For the purposes of Memorandum of Understanding and Power of Attorney:

The agreements are to be executed by the all members in case of a Consortium.

The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants and when it is so required the same should be under common seal affixed in accordance with the required procedure.

Also, wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a resolution/power of attorney in favour of the lead member.

**Note:** The above **Memorandum of Understanding** should be furnished in Non Judicial Stamp Paper, not less than Rupees One Hundred.

**Form-IX**

**PERFORMANCE BANK GUARANTEE**

To:

**The Chief Executive Officer,**

Puducherry Smart City Development Limited,  
No.2. Bussy Street,  
Old court building,  
Puducherry- 605 001.

WHEREAS \_\_\_\_\_ *[name and address of Contractor]*  
(hereinafter called " the Contractor") has undertaken, in pursuance of Contract  
No. \_\_\_\_\_ dated \_\_\_\_\_ to  
execute Construction of  
\_\_\_\_\_ (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall  
furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as  
security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on  
behalf of the Contractor, up to a total of \_\_\_\_\_ *[amount of*  
*guarantee]* \_\_\_\_\_ *[in words]*, such  
sum being payable in the types and

\_\_\_\_\_ proportions of currencies in which the Contract Price is payable, and we undertake to pay  
you, upon your first written demand and without cavil or argument, any sum or sums within  
the limits of \_\_\_\_\_ *[amount of guarantee]*<sup>1</sup> as aforesaid without  
your needing to prove or to show grounds or reasons for your demand for the sum specified  
therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before  
presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the  
Contract or of the Works to be performed there under or of any of the Contract documents  
which may be made between you and the Contractor shall in any way release us from any  
liability under this guarantee, and we hereby waive notice of any such change, addition or  
modification.

This guarantee shall be valid until ..... (i.e.) 28 days from the date of expiry of the  
Defects Liability Period.

Signature and seal of the guarantor \_\_\_\_\_

Name of Bank \_\_\_\_\_

Address \_\_\_\_\_

Date \_\_\_\_\_

1. An amount shall be inserted by the Guarantor, representing the percentage of the  
Contract Price specified in the Contract and denominated in Indian Rupees.

**Note:** The above **performance bank guarantee** should be furnished in Non Judicial Stamp  
Paper, not less than Rupees One Hundred.

## **SECTION 6**

### **DRAWINGS AND ANNEXURE**

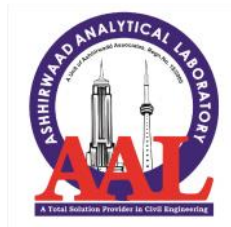
# ASHHIRWAAD ANALYTICAL LABORATORY

(NABL Accredited Laboratory TC - 8619)

(A Unit of Ashhirwaad Associates - Regd. No. 18/2000)

(Approved by Government of India)

Civil Engineering Consultancy Services



- ❖ Geotechnical Investigation
- ❖ Survey and contouring
- ❖ Load testing on Piles
- ❖ Structural consultancy
- ❖ Material testing
- ❖ NDT Services

"A Total Solution Provider In Civil Engineering Services"



NABL - TC - 8619

ISO/IEC 17025:2005

Ref: AAL/8194/GT-Report/P.No.1627/Nehru street/Pdy/2020-21

Date: 29.08.2020

## GEOTECHNICAL INVESTIGATION REPORT

**PROJECT : GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF MULTI LEVEL CAR PARKING AT OLD JAIL COMPLEX, NEHRU STREET, PUDUCHERRY.**

**PROJECT NO : AAL.1627/NEHRU STREET/PDY/2020-21.**

**CLIENT : THE CHIEF EXECUTIVE OFFICER,  
PSCDL,  
PUDUCHERRY.**

**REFERENCE : WORK ORDER NO: 1040/PSCDL/MLCP/2020/513 DATE: 11.08.2020**

**EXPLORATION  
DATE : 13.08.2020 – 15.08.2020.**

**DATE OF  
REPORT : 29.08.2020.**

Head Office: "Mayan Vihar" No.182, 2<sup>nd</sup> Floor, 4<sup>th</sup> Main Road, Mahaveer Nagar, Karuvadikuppam, Puducherry-605008 Phone: 0413-2252663 Extn.27 & 31 Cell: 7598491505

Branch Office: No. 14/57C, Nerkundram Road, Vadapalani, Chennai – 26. Cell: 9629486505  
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Ref: AAL/8194/GT-Report/P.No.1627/Nehru street/Pdy/2020-21

Date: 29.08.2020

**NAME OF WORK: GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF MULTI LEVEL CAR PARKING AT OLD JAIL COMPLEX, NEHRU STREET, PUDUCHERRY.**

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### 11. DRY SIEVE CHART

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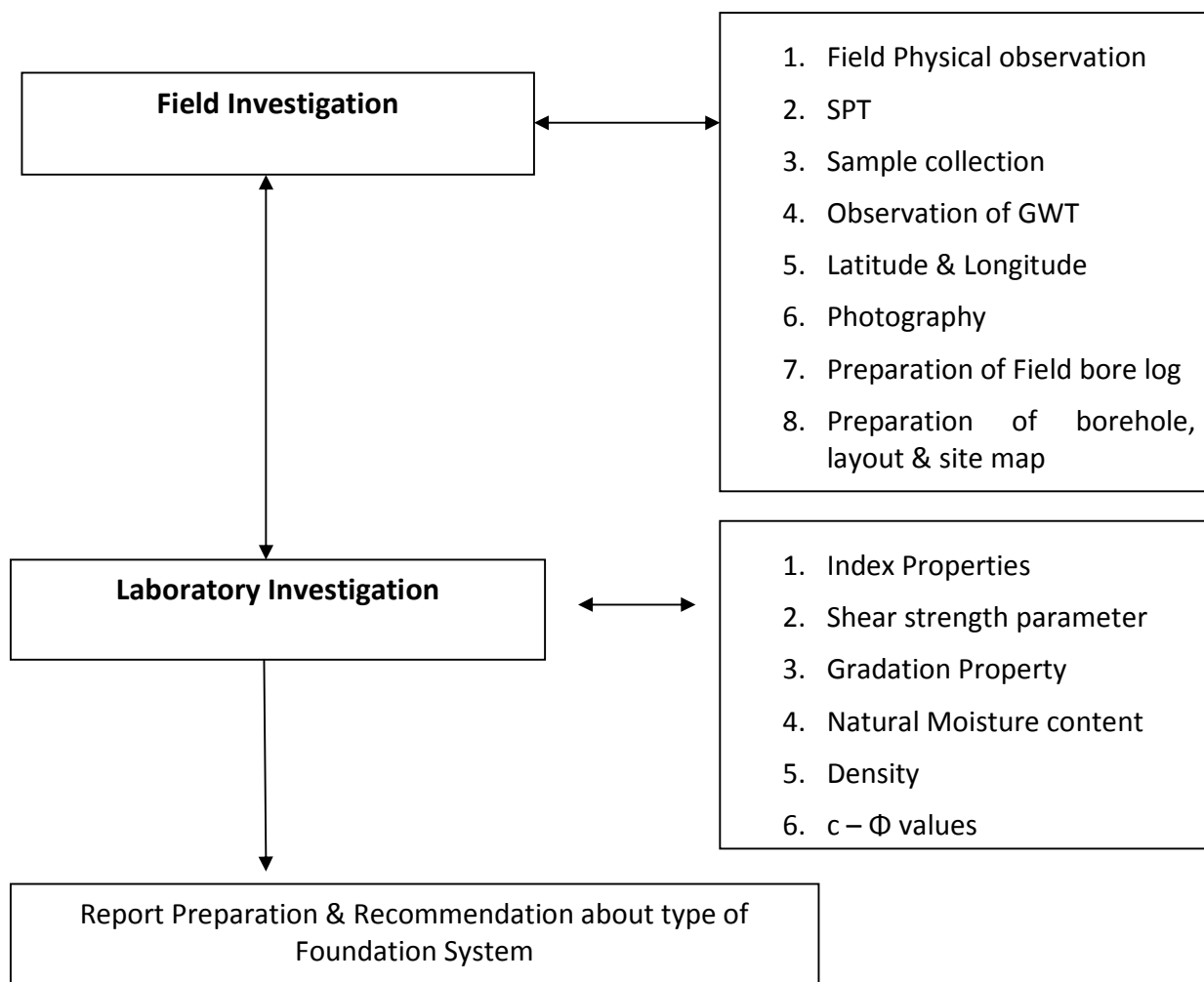
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## 1. INTRODUCTION

A Geotechnical investigation for the above said work was undertaken as per the authorization given by **THE CHIEF EXECUTIVE OFFICER, PSCDL, Puducherry.**

### FLOW CHART



**Head Office:** "Mayan Vihar" No.182, 2<sup>nd</sup> Floor, 4<sup>th</sup> Main Road, Mahaveer Nagar, Karuvadikuppam, Puducherry-605008 Phone: 0413-2252663 Extn.27 & 31 Cell: 7598491505

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## 2. SCOPE OF WORK

**2.1** This geotechnical investigation has been carried out to ascertain the safe bearing capacity and to decide upon suitable foundation system for the proposed structure. It was instructed to make two number of bore holes. The BH -1 was driven upto 20.0 m depth BH-2 & BH-3 was driven upto 10.0m depth and terminated as per the clients instruction.

**2.2** The allowable safe bearing capacity of the soil is calculated based on the field geotechnical investigation, soil properties, GWT and subsequent laboratory experiments.

## 3. FIELD INVESTIGATION

### 3.1 GENERAL

Mobilizations of equipment, skilled and unskilled labours are arranged at site. The various factors for the number and position of boreholes and spacing of boreholes are based on the extent of the site, nature and type of structure. Depth of borehole is concluded based on condition of soil, penetration capacity of soil, shear failure and hard strata condition. Standard Penetration Test (SPT) is conducted at various depths. The disturbed soil sample is collected from the site and transported for examination to Ashhirwaad Analytical Laboratory. The field investigation is being monitored by experienced civil engineers/ Geotechnical/ Structural Engineer.

### 3.2 STANDARD PENETRATION TEST (IS: 2131 – 1981)

#### EQUIPMENT PREPARATION

##### 3.2.1 DRILLING EQUIPMENT

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The equipment used shall provide a clean borehole 100 to 150 mm in diameter, for insertion of the sampler ensure that the penetration test is performed on undisturbed soil and shall permit driving of the split spoon sampler to obtain penetration record and sample in accordance with procedure.

## 3.2.2 DRIVE WEIGHT ASSEMBLY

The drive weight assembly shall consist of driving head and a 63.5 kg weight with 75cm free fall. It is ensured that the energy of the falling weight is not reduced by friction between the drive weight and the guides. The rods to which the sampler is attached for driving should be straight, tightly coupled and straight in alignment. For driving the casting, a hammer heavier than 63.5 kg may be used.

## 3.2.3 CLEANING THE BOREHOLE

In case wash boring is adopted for cleaning the borehole, side discharge bits are permissible, but in no case a bottom discharge bit be permitted. In cohesive soils, the borehole may be cleaned with bailer with a flap valve.

## 3.2.4 OBTAINING THE SAMPLES

Test shall be made at every change in stratum or at intervals of not more than 1.5 m whichever is less. Tests may be made at lesser or greater intervals if specified or considered necessary.

The sampler shall be lowered to the bottom of the borehole. The following information shall be noted and recorded.

- (a) Depth of bottom of borehole below ground level.
- (b) Penetration of the sampler into the soil under the combined weight of sampler and rods

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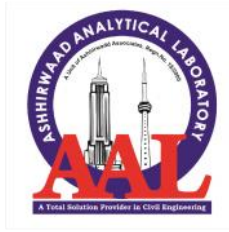
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- (c) Water level in the borehole or casting
- (d) Depth of bottom of casting below ground level.

Labels shall be fixed to the jar or notation shall be written on the covers with the following information:

- a) Origin of sample
- b) Job designation
- c) Boring number
- d) Sample number
- e) Depth of sampling
- f) Penetration record
- g) Length of recovery
- h) Date of sampling

The jars containing samples shall be stored in suitable container for shipment. Samples should not be placed in the sun.

### 3.3 IS CODE FOR FIELD INVESTIGATION

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 1498 – 1970 (Reaffirmed 2007)	Classification & Identification of soil for general engineering purpose (First Revision)
2	IS : 1892 – 1979 (Reaffirmed 2002)	Code of practice for sub surface investigation for foundation (First Revision)
3	IS : 2131 – 1981 (Reaffirmed 2002)	Method of Standard Penetration Test for soil (First Revision)
4	IS : 2132 – 1986 (Reaffirmed 2002)	Code of practice for thin walled tube sampling of soil (Second Revision)
5	IS : 4968 – 1976 (Reaffirmed 2007)	Method of sub surface sounding of soil : Static cone penetration (First Revision)

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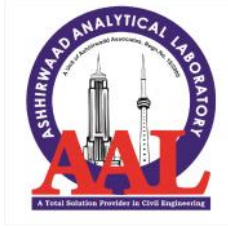
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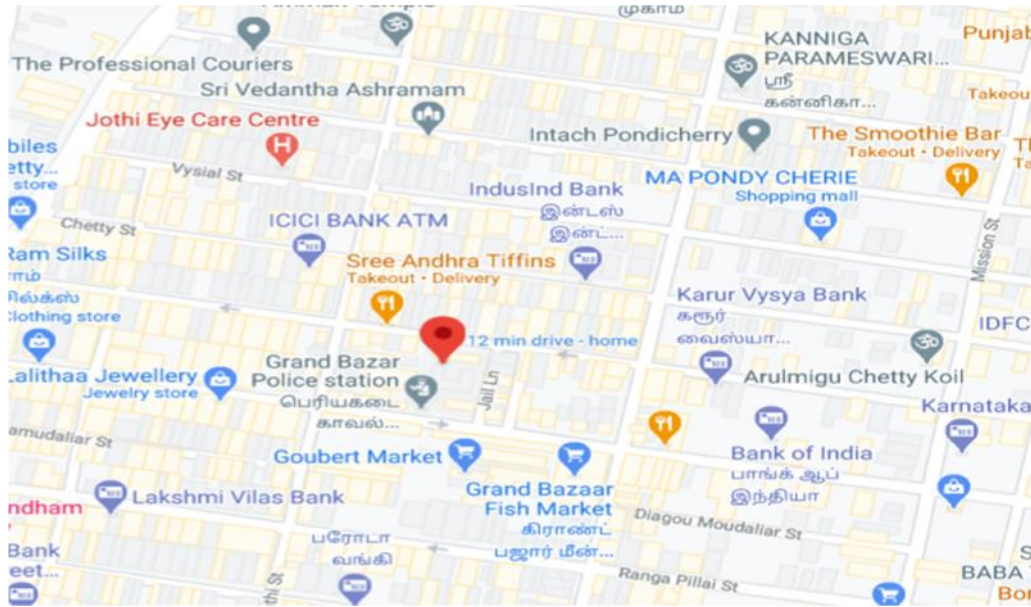
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## 3.4 SITE EXPLORATION

Subsurface exploration should be carried out in preliminary and detailed exploration. Shear strength and compressibility of the soil is determined in the detailed exploration. The method of boring for soil exploration is rotary boring. Rotary boring is effected by cutting action of the soil. The bit is carried at the end of hollow, jointed drill rods which is rotated by the chuck. A mud laden fluid is pumped continuously and fluid returns to surface in angular space. Undisturbed samples are collected at suitable intervals.

## 3.5 SITE MAP



Bore Hole No	LATITUDE	LONGITUDE
BH-1	11°56'11.24"N	79°49'42.18"E
BH-2	11°56'11.24"N	79°49'42.18"E
BH-3	11°56'12.33"N	79°49'41.79"E

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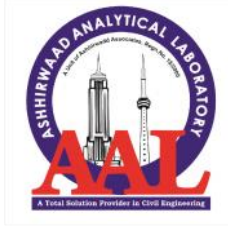
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## 3.6 BOREHOLE DETAILS

Three number of bore holes are driven in the field at various location of the site. As per IS: 1892 - 1979 (Reaffirmed 2002), the various driven depth of the borehole, Ground Water Table and their corresponding identifications are tabulated below

SL.NO	BOREHOLE IDENTIFICATION NUMBER	DRIVEN BOREHOLE DEPTH (m)
1.	BH-1	20.0
2.	BH-2	10.0
3.	BH-3	10.0

BOREHOLE IDENTIFICATION NUMBER	GROUND WATER TABLE (m)
BH-1	1.20
BH-2	1.20
BH-3	1.20

## 4. GEOTECHNICAL MODELLING AND OBSERVATION:

### 4.1 GENERAL

Various laboratory test are carried out to assess the soil as per IS code standard and calculations are done. The results of the test are tabulated and interpretation is given.

### 4.2 LIST OF IS CODE

#### 4.2.1 LABORATORY IS CODE

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 2720 – 1983 (Part – 1) (Reaffirmed 2006)	Methods of test for soil :Preparation of dry soil sample for various test (Second Revision)

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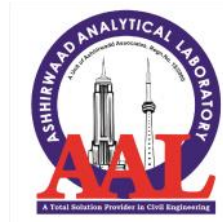
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2	IS 2720 – 1980 (Part – 2) (Reaffirmed 2010)	Methods of test for soil : Determination of water content (Second Revision)
3	IS 2720 – 1980 (Part – 3) (SECTION – 1) (Reaffirmed 2002)	Methods of test for soil : Determination of specific gravity : Fine grained soil (First Revision)
4	IS 2720 – 1980 (Part – 3) (SECTION – 2) (Reaffirmed 2002)	Methods of test for soil : Determination of specific gravity : Fine, Medium, Coarse grained soil (First Revision)
5	IS 2720 – 1985 (Part – 4) (Reaffirmed 2006)	Methods of test for soil : Grain size analysis(Second Revision)
6	IS 2720 – 1985 (Part – 5) (Reaffirmed 2006)	Methods of test for soil : Determination of liquid and plastic limit (Second Revision)
7	IS 2720 – 1985 (Part – 15) (Reaffirmed 2006)	Methods of test for soil : Determination of consolidation properties (First Revision)
8	IS 1809 – 1972 (Reaffirmed 2006)	Methods of test for soil : Glossary of terms & symbols relating to soil engineering (Third Revision)

## 4.2.2 FOUNDATION IS CODE

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 1080 – 1986 (Reaffirmed 2002)	Code of practice for design and construction of shallow foundation on soil (other than raft, ring and shell) (Second Revision)
2	IS 1904 : 1968 (Reaffirmed 2006)	Code of practice for design and construction of foundation on soil :General requirement (Third Revision)
3	IS 6403 – 1981 (Reaffirmed 2002)	Code of practice for determination of bearing capacity of shallow foundation (First Revision)

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## 4.2.3 SEISMIC IS CODE

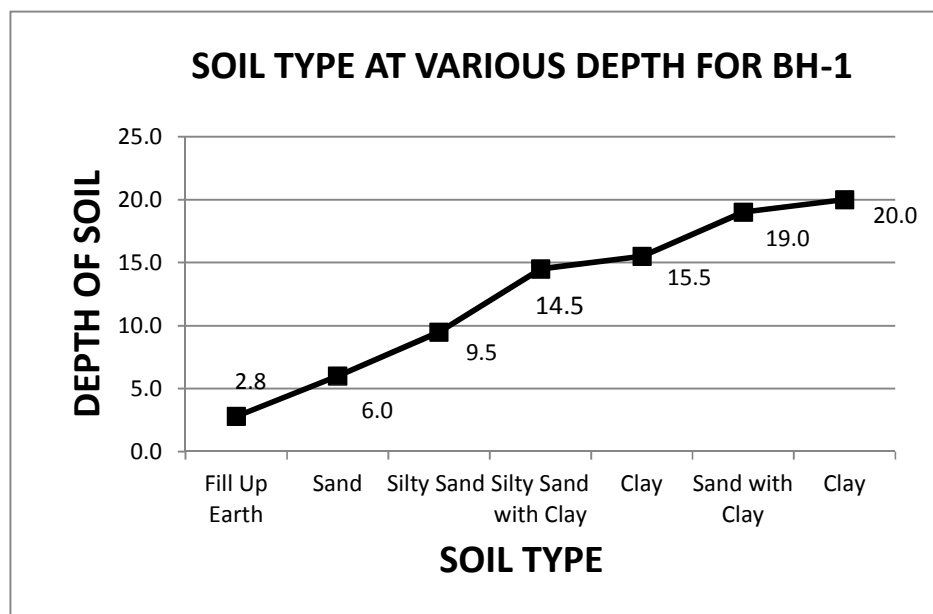
SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS 1893 – 2002 (Reaffirmed 2007)	Criteria for Earthquake Resistant design of Structures(Fifth Revision)

## 4.3 RESULT:

Laboratory tests the following soil profiles for the boreholes as observed is detailed below:

### BH -1

The details of soil stratification are presented in the bore - log and their interpretation is shown below



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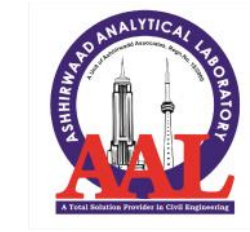
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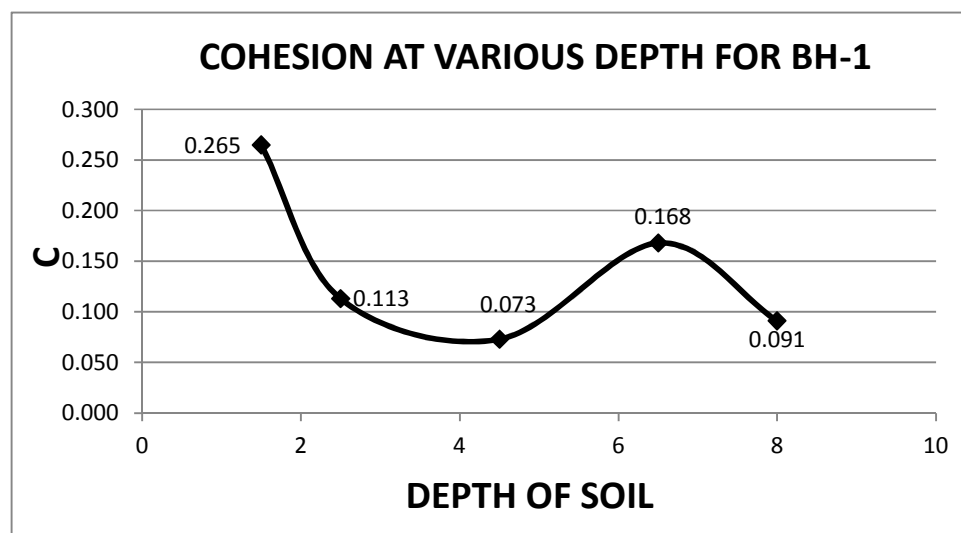
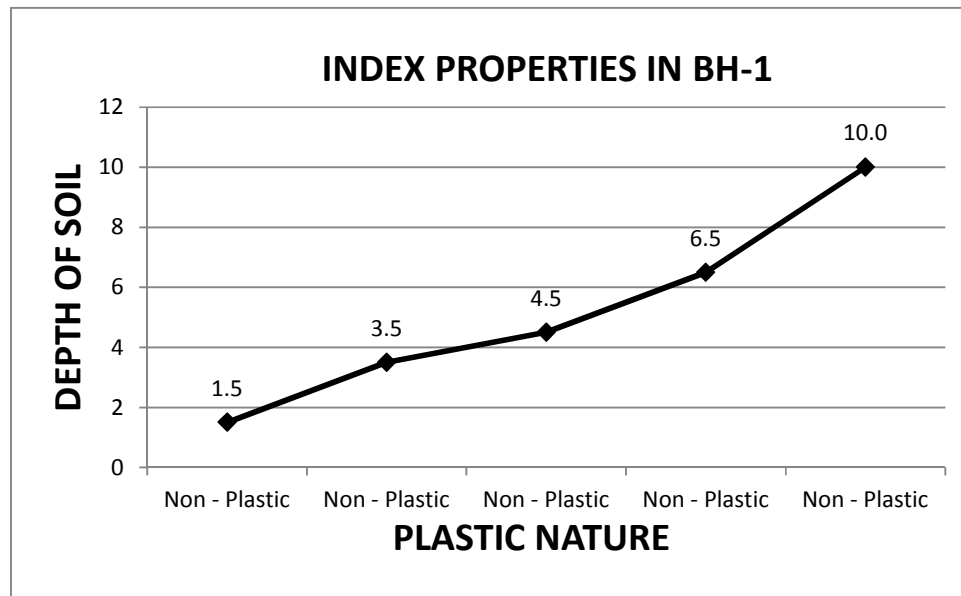
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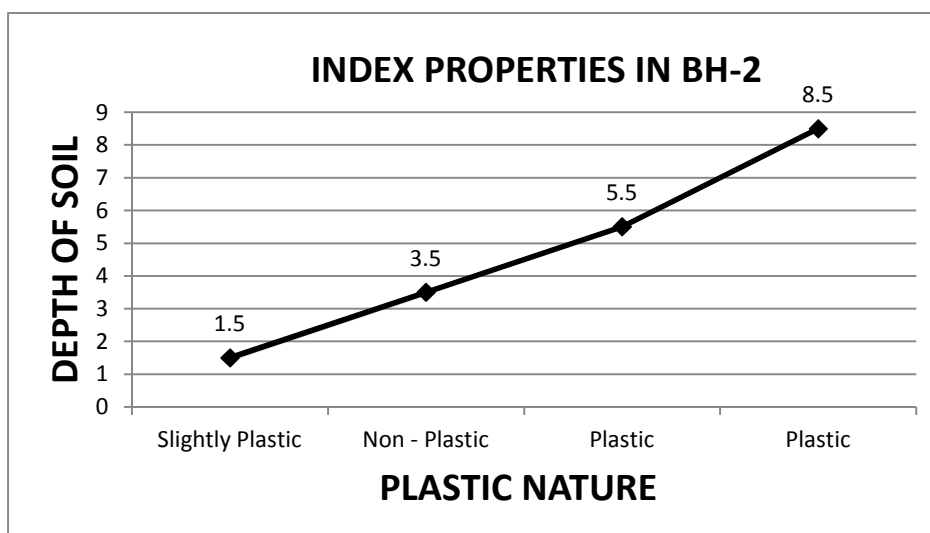
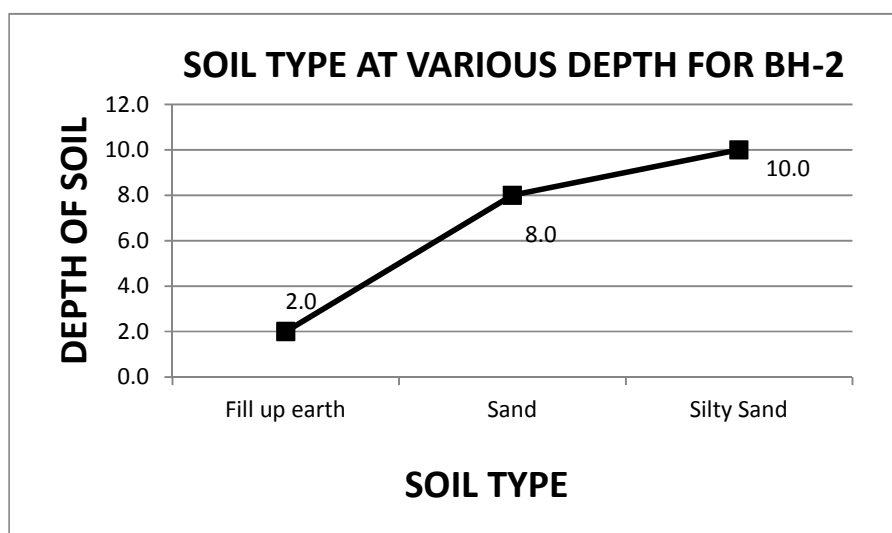
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## BH -2

The details of soil stratification are presented in the bore - log and their interpretation is shown below



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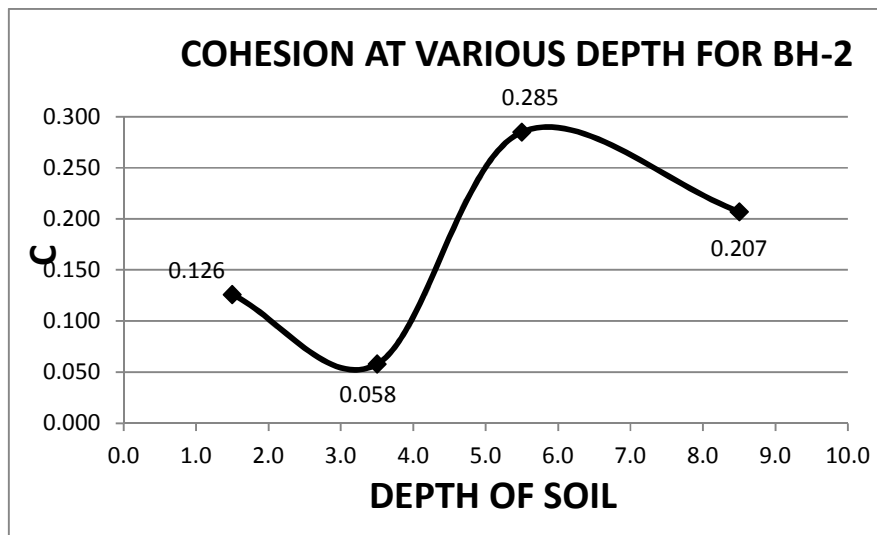


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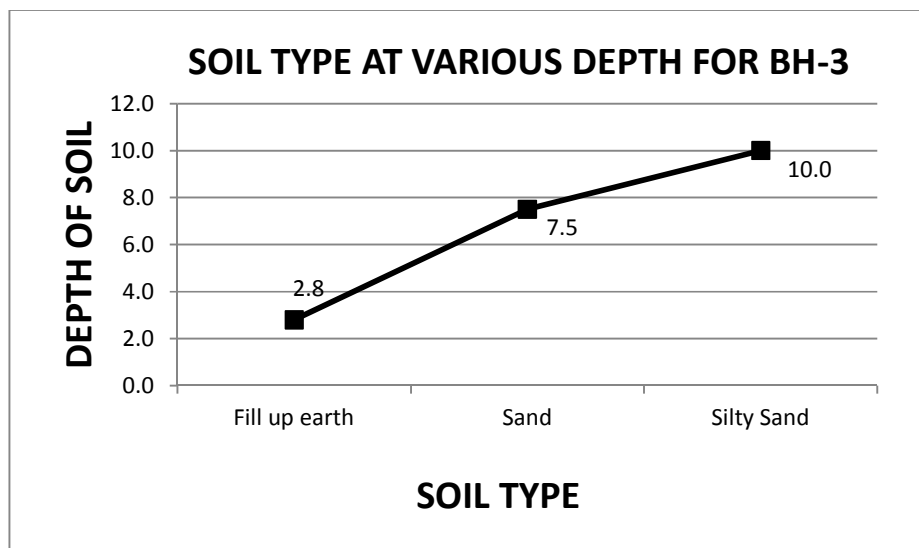
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## **BH -3**

The details of soil stratification are presented in the bore - log and their interpretation is shown below



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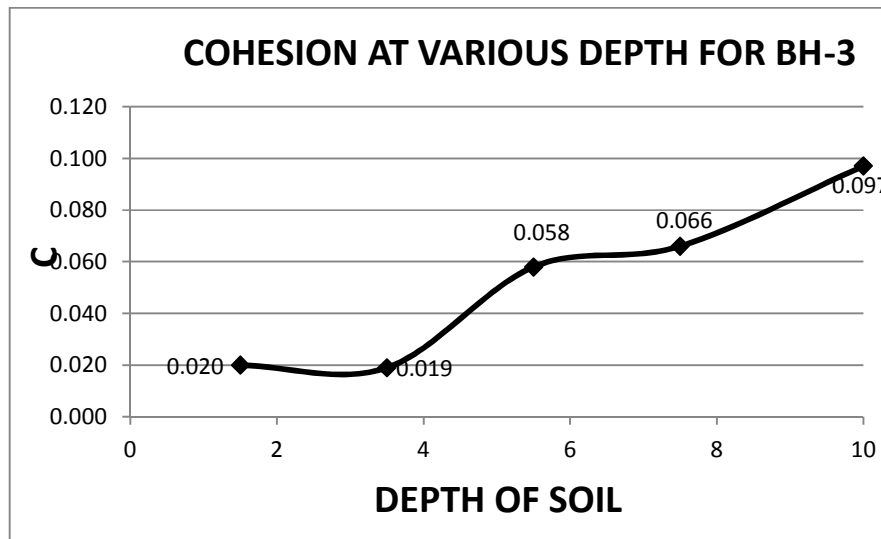
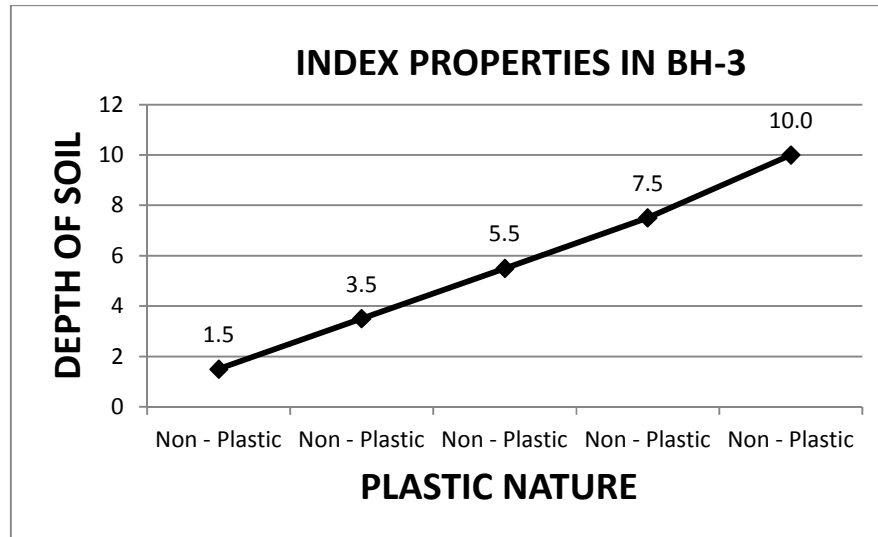
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## 5. CHEMICAL TEST:

Chemical tests were performed on water samples collected from bore holes for determining pH value and chloride. The results are given in a tabular form below:

**Table 5.1**  
**As per IS 3025 (Part 11 & 32), IS 456-2000.**

SL.NO	Particulars	Results	Stipulations of IS 456-2000, IS 3025(Part 32) (Water for Construction Purpose)
1.	pH value	7.9	6.5 – 8.5
2.	Chloride	201.17mg/l	500 - 2000 mg/l

It is seen that the values are within the permissible limit (As per IS 456-2000). So no special cement will be required for foundation concrete.

## 6. RECOMMENDATIONS:

The following recommendations are made based on the field investigations SPT values, GWT and subsequent Laboratory Experiments.

**6.1** Considering in situ condition of the soil Strata, two types of foundations are suggested for the **Proposed Construction Of Multi Level Car Parking at Old jail Complex, Nehru Street, Pondicherry.**

a) Isolated/Combined Footing

or

b) Strip Raft Foundation

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**Note:** Filled up Earth Formation was seen in the Bore Hole Locations upto a maximum Depth of 2.80m from the NGL. Hence Footing have to be founded over/Medium to Dense Layer available beyond 2.80m.

**6.2** If **"ISOLATED/COMBINED FOOTING"** is considered, the allowable safe bearing capacities are calculated and tabulated below along with the allowable settlement.

**Table 6.2.1**  
**Safe Bearing Capacity Calculation As per IS 6403:1981**

Sl. No.	Bore Hole No	Depth in meter from NGL	SBC in T/m <sup>2</sup>	As per IS:1904-1986 (Reaffirmed 2006)	
				Total Arrived Settlement (mm)	Total Arrived Settlement (mm)
1.	BH-1	3.0	13	3.34	50
2.	BH-2 &	3.25	15	4.00	50
3.	BH-3	3.5	17	4.66	50

**6.3.** If **"STRIP RAFT FOUNDATION"** is considered, the allowable safe bearing capacities are calculated and tabulated below along with the allowable settlement.

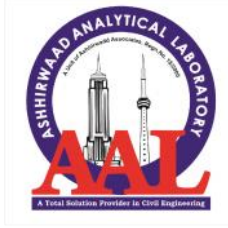
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**Table 6.3.1**  
**Safe Bearing Capacity Calculation As per IS 6403:1981**

Sl. No.	Bore Hole No	Depth in meter from NGL	SBC in T/m <sup>2</sup>	As per IS:1904-1986 (Reaffirmed 2006)	
				Total Allowable Settlement (mm)	Total Allowable Settlement (mm)
1.	BH-1	3.0	15	4.11	75
2.	BH-2 & BH-3	3.25	17	4.73	75
3.		3.50	19	5.12	75

**\*NGL –Natural Ground Level**

6.3.2 The Decision of selecting the suitable type and depth of foundation rests with the Structural Engineer Concerned.

6.3.3 The width of footing should not be less than 1.5m in order to satisfy the stability requirements.

6.4 **SAFETY PRECAUTIONS:** Since the **GWT** is located at 1.20m depth, during construction, adequate safety measures should be taken for the safety of adjacent structures by controlled and constant dewatering with sufficient support measures for prevention of the sliding soil mass. The safety of the men, machineries and structure should be ensured.

6.5 For the sub structure [RCC] the environmental exposure condition may be considered as '**Severe**' and all the precautions as laid by the relevant code of practice for the design of structures may be adopted.

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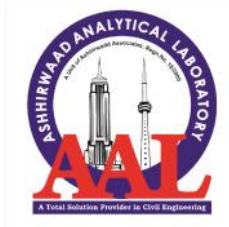
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6.6 The entire recommendations as above are based on three bore holes executed as per the Clients directions at the location shown by the client's representative as per terms of reference. The uniformity or otherwise of the soil delineation and strength profile over the entire site shall be verified during execution. If there are any variations the same shall be reported to us for review and further advice.

S\d-

**Er. N.J.L. RAMESH**

CHIEF CONSULTANT (Geotech& Structures)

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**Place : Puducherry**

**Date : 29.08.2020**

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## 7.APPENDICES

### 7.1 SAFE BEARING CAPACITY CALCULATIONS:

**7.1.1** For Shallow foundation it is as per **IS: 1904 – 1995**, *Code of practice for design and construction of foundations*: General requirements (third revision). The recommended safe bearing Capacity of soil for shallow foundation was calculated as per **IS: 6403-1981**, *Code of practice for Determination of Bearing Capacity of Shallow Foundation*. The settlement calculations are as per **IS: 8009 (Part-I) - 1976**, *Code of practice for calculation of settlements in foundations, part I Shallow foundation subjected to symmetrical static vertical Loads*. All the calculations are carried out based on the SPT value observed from the field.

### 7.2. SAFE BEARING CAPACITY CALCULATION FORMULAE:

#### 7.2.1 FOR SHALLOW FOUNDATION:

IN CASE OF GENERAL SHEAR FAILURE AS PER IS: 6403: 1981

$$\text{The Ultimate Net Bearing Capacity } q_d = c N_c s_c d_c i_c + q (N_q - 1) s_q d_q i_q + 0.5 B \gamma N_\gamma s_\gamma d_\gamma i_\gamma W'$$

$$\text{Safe Load Carrying Capacity} = q_d / F.S$$

#### DEPTH FACTOR

$$d_c = 1 + (0.2 D_f / B \sqrt{N_\phi})$$

$$d_q = d_\gamma = 1 \text{ for } \phi < 10^\circ$$

$$d_q = d_\gamma = 1 + 0.1 D_f / B \sqrt{N_\phi} \text{ for } \phi > 10^\circ$$

#### INCLINATION FACTOR

$$i_c = i_q = (1 - \alpha / 90)^\circ$$

$$i_\gamma = (1 - \alpha / \phi)^\circ$$

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## SHAPE FACTOR

Sl. No.	Shape of Base	$s_c$	$s_q$	$s_\gamma$
i)	Continuous strip	1.00	1.00	1.00
ii)	Rectangle	$1 + 0.2 B/L$	$1 + 0.2 B/L$	$1 - 0.4 B/L$
iii)	Square	1.3	1.2	0.8
iv)	Circle	1.3	1.2	0.6

Where,

<b>c</b>	= Cohesion in Kg/cm
<b><math>D_f</math></b>	= Depth of foundation in cm
<b><math>d_c, d_q, d_\gamma</math></b>	= Depth factors
<b><math>i_c, i_q, i_\gamma</math></b>	= Inclination factors
<b>L</b>	= Length of footing in cm
<b><math>L'</math></b>	= Effective length of footing in cm
<b>N</b>	= Corrected standard penetration value
<b><math>N_c, N_q, N_\gamma</math></b>	= Bearing capacity factors
<b><math>N_\phi</math></b>	= $\tan^2 (\pi/4 + \phi/2)$
<b>q</b>	= Effective surcharge at the base level of Foundation
<b>qd</b>	= Net ultimate bearing capacity based on general shear failure
<b><math>W'</math></b>	= Correction factor for location of water table
<b><math>\alpha</math></b>	= Inclination of the load to the vertical in degrees
<b><math>\phi</math></b>	= Angle of shearing resistance of soil in degrees
<b><math>\gamma</math></b>	= Bulk unit weight of foundation soil
<b>F.S</b>	= Factor of safety.

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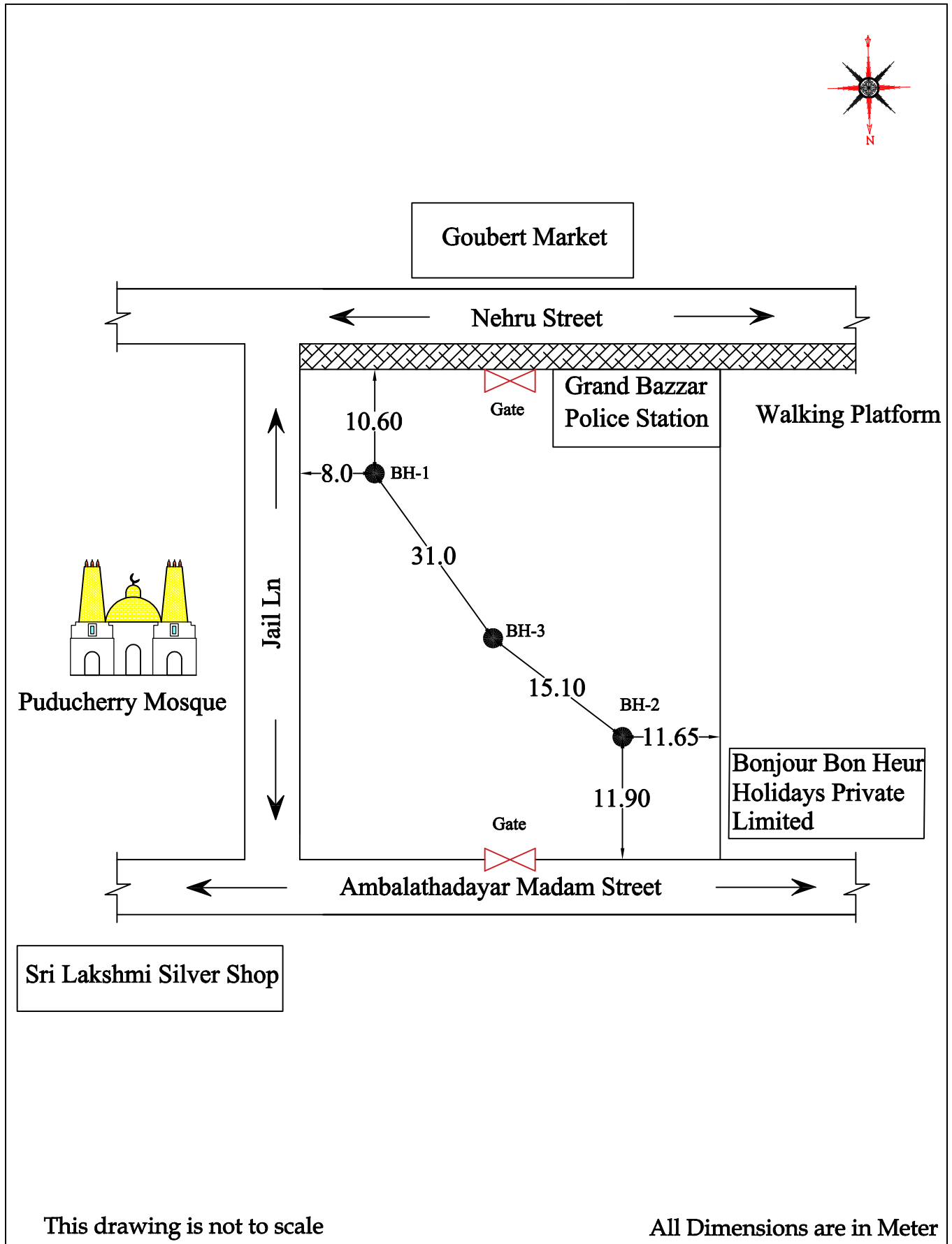


**Fig. 1 – Site Photo Showing the Soil Exploration Work.**

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## Borehole Layout



Name Of The Work : Geotechnical Investigation For The Proposed Construction Of Multi Level Car Parking at Old jail Complex, Nehru Street, Puducherry.

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ULR : TC86192000000260F

BORE LOG - 1/3

Project No:		AAL.1627/Pdy/2020		Date:		13.08.2020		Location:		Old Jail Complex, Puducherry.						Index properties (%)					Shear strength parameters		Gradation properties (%)													
BH. No :		1		GWT (m):		1.20		Graphical Representation of Standard Penetration Test Data (N)						Description /consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> ) Plastic limit (W <sub>p</sub> ) Plasticity index(I <sub>p</sub> ) Consistency index (I <sub>c</sub> ) Free swell index(Cs)					Direct shear test		Sieve analysis												
Depth of boring (m) :		20.00				C (kg/cm <sup>2</sup> )																$\phi$ (degrees)		Gravel	Coarse sand	Medium sand	Fine sand	silt & clay								
Depth Below GL	Soil stratum	Classification of soil	Thickness of Layer (m)	Depth of Sampling(m)		N Value	10										20	30	40	50	Liquid limit (W <sub>L</sub> )	Plastic limit (W <sub>p</sub> )	Plasticity index(I <sub>p</sub> )						Consistency index (I <sub>c</sub> )	Free swell index(Cs)	C (kg/cm <sup>2</sup> )	$\phi$ (degrees)	Gravel	Coarse sand	Medium sand	Fine sand
1.0		Fill up earth Sand (SW) with gravel	2.80		0.5	3							Very Loose						0.033	31°10'	18.06	5.29	65.20	9.69	1.76											
					1.0																															
					1.5																															
2.0					2.0																															
					2.5																															
3.0		Light Brown Sand (SW)	3.40		3.0	11								Medium																						
					3.5	19																														
4.0					4.0																															
					4.5	35																														
5.0					5.0																															
				5.5	33																															
6.0		Black Silty sand (SM-SW)	3.50	6.0																																
				6.5	32																															
7.0				7.0																																
				7.5	26																															
8.0				8.0																																
				8.5	41																															
9.0				9.0																																
	9.5																																			
10.0		Silty sand (SM-SW)	0.50		10.0	9								Loose	37	1.72																				

Project No: AAL.1627/2020

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Name Of The Work : Geotechnical Investigation For The Proposed Construction Of Multi Level Car Parking at Old jail Complex, Nehru Street,  
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ULR : TC86192000000260F

BORE LOG - 1/3

Project No:		AAL.1627/Pdy/2020	Date:	13.08.2020		Location:	Old Jail Complex, Puducherry.							Index properties (%)					Shear strength parameters		Gradation properties (%)								
BH. No :		1	GWT (m):	1.20		Graphical Representation of						Description/consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> ) Plastic limit (W <sub>p</sub> ) Plasticity index(I <sub>p</sub> ) Consistency index (I <sub>c</sub> ) Free swell index(C <sub>s</sub> )					Direct shear test		Sieve analysis							
Depth of boring (m) :		20.00		Standard Penetration																									
Depth Below GL	Soil stratum	Classification of soil	Thickness of Layer (m)	Depth of Sampling(m)		Test Data (N)						Description/consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> )	Plastic limit (W <sub>p</sub> )	Plasticity index(I <sub>p</sub> )	Consistency index (I <sub>c</sub> )	Free swell index(C <sub>s</sub> )	C (kg/cm <sup>2</sup> )	Φ (degrees)	Gravel	Coarse sand	Medium sand	Fine sand	silt & clay			
				UDS	DS	N Value	10	20	30	40	50																		
11.0		Black Silty Sand (SM-SW) with clay	4.50		10.5	4						Very Loose																	
12.0					11.0																								
13.0					11.5	4																							
					12.0																								
14.0					12.5	5																							
					13.0																								
15.0					13.5	5																							
					14.0																								
16.0		Black Clay (CH)	1.00		14.5	9																							
17.0					15.0																								
18.0		Black Sand (SP) with clay	3.50		15.5	9																							
					16.0																								
19.0					16.5	6																							
					17.0																								
20.0					17.5	12																							
					18.0																								
					18.5	6																							
					19.0																								
		Black Clay (CH)	1.00		19.5	10																							
					20.0																								

Project No: AAL.1627/2020

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ULR : TC861920000000261F

BORE LOG - 2/3

Project No:		AAL.1627/Pdy/2020	Date:	15.08.2020		Location:	Old Jail Complex, Puducherry							Index properties (%)					Shear strength parameters		Gradation properties (%)									
BH. No :		2	GWT (m):	1.20		Graphical Representation of					Description /consistency	Natural moisture content (%)	Density ( γ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> ) Plastic limit (W <sub>p</sub> ) Plasticity index(I <sub>p</sub> ) Consistency index (I <sub>c</sub> ) Free swell index(Cs)					Direct shear test		Sieve analysis									
Depth of boring (m) :		20.00		Standard Penetration															Test Data (N)		C (kg/cm <sup>2</sup> )	Φ (degrees)	Gravel	Coarse sand	Medium sand	Fine sand	silt & clay			
Depth Below GL	Soil stratum	Classification of soil	Thickness of Layer (m)	Depth of Sampling(m)		UDS	DS	N Value	10	20	30	40	50																	
1.0		Fill Up Earth Red sand	2.00			0.5	5							Loose																
						1.0																								
2.0						1.5																								
						2.0																								
3.0		Light Brown Sand (SP)	6.00			2.5	11							Medium																
						3.0																								
4.0						3.5	16										Medium													
						4.0																								
5.0						4.5	26										Medium													
						5.0																								
6.0						5.5	55										Very Dense													
						6.0																								
7.0						6.5	50 <sub>(7cm1)</sub>										Very Dense													
						7.0																								
8.0						7.5	46										Dense													
						8.0																								
9.0		Black Silty Sand (SM-SW)	2.00			8.5	19							Medium																
						9.0																								
10.0						9.5	12										Medium													
						10.0																								

Project No: AAL.1627/2020

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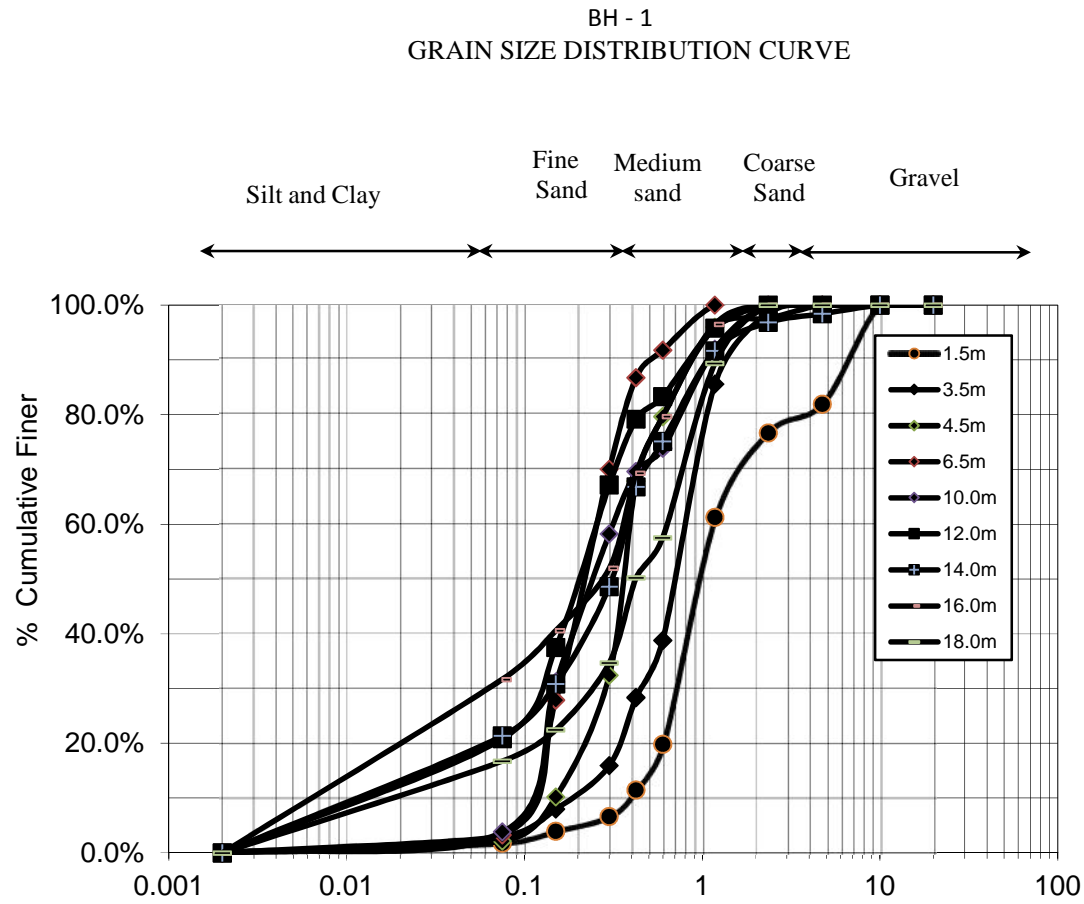
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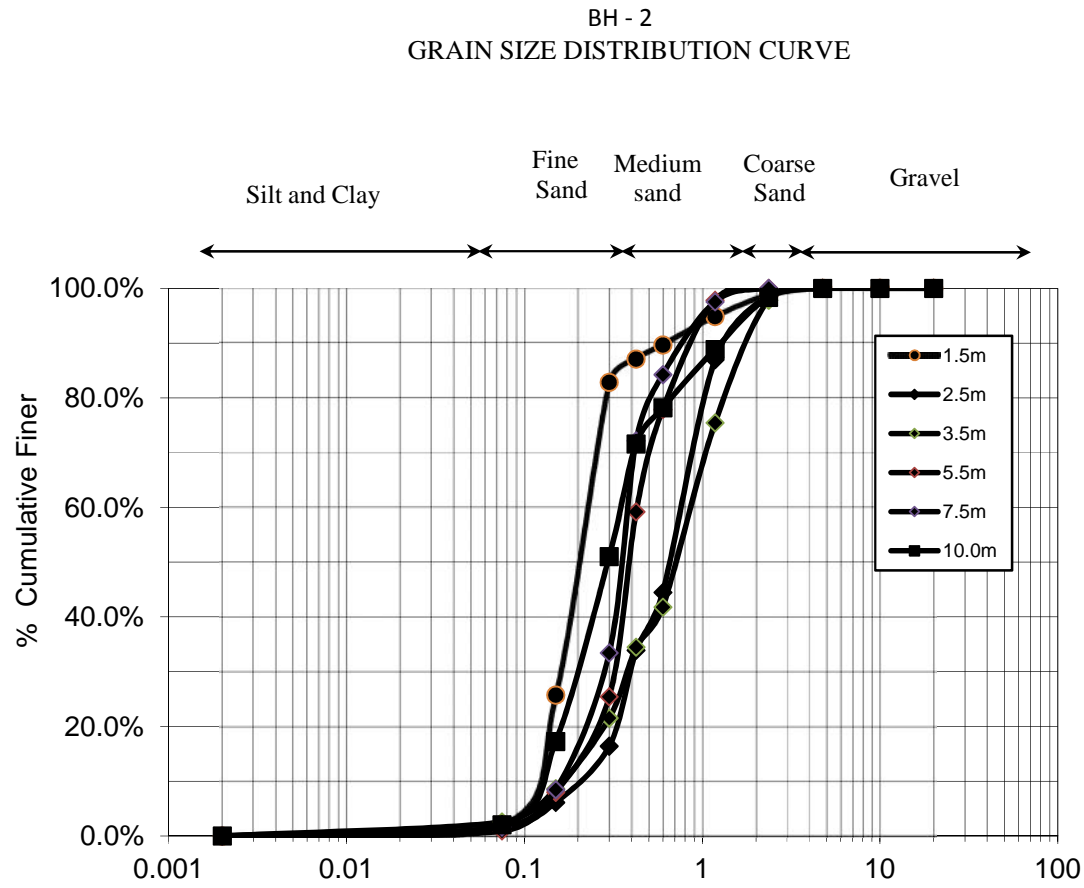
BORE LOG - 3/3

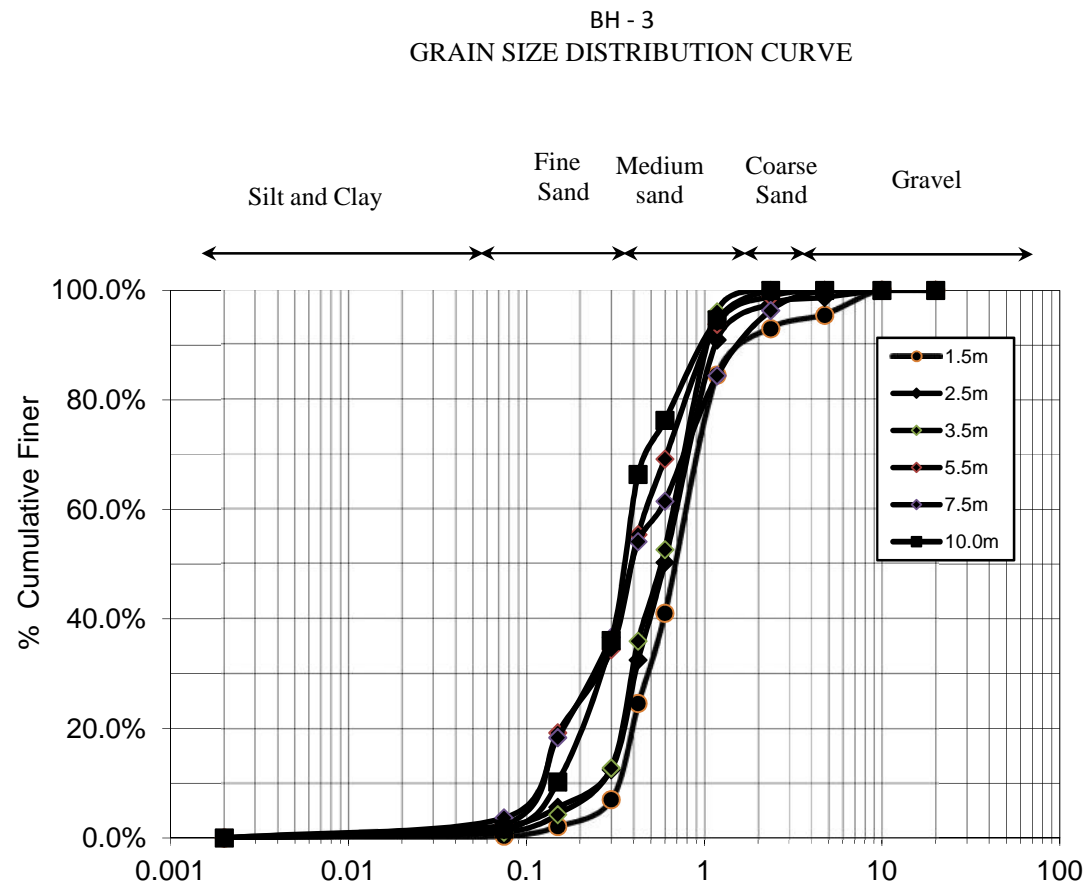
Project No:		AAL.1627/2020	Date:	16.08.2020		Location:	Old Jail Complex, Puducherry							Index properties (%)					Shear strength parameters		Gradation properties (%)				
BH. No :		3	GWT (m):	1.20		Graphical Representation of					Description /consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> )	Plastic limit (W <sub>p</sub> )	Plasticity index(I <sub>p</sub> )	Consistency index (I <sub>c</sub> )	Free swell index(C <sub>s</sub> )	Direct shear test		Sieve analysis				
Depth of boring (m) :		10.00		Standard Penetration															C (kg/cm <sup>2</sup> )	Φ (degrees)	Gravel	Coarse sand	Medium sand	Fine sand	silt & clay
Depth Below GL	Soil stratum	Classification of soil	Thickness of Layer (m)	Depth of Sampling(m)		Test Data (N)					Loose	19	1.59	Non - Plastic	Nil	0.020	30°32'	4.56							
			UDS	DS	N Value	10	20	30	40	50															
1.0		Fill Up Earth Sand (SW) with gravel	2.80		0.5	6							Loose	19	1.59	Non - Plastic		Nil	0.020	30°32'	4.56	1.65	26.75	69.55	2.06
					1.0																				
					1.5																				
2.0					2.0	8							Medium												
					2.5																				
3.0		Light Brown Sand (SP)	4.70		3.0	16							Medium	22	1.73	Non - Plastic		Nil	0.019	31°10'	0.00	0.00	64.06	34.88	1.07
					3.5																				
					4.0																				
4.0					4.5	26							Medium												
					5.0																				
5.0				5.5	21							Very Dense	21	1.73	Non - Plastic		Nil	0.058	30°32'	0.00	1.09	43.48	52.90	2.54	
				6.0																					
				6.5																					
6.0				7.0	18							Very Dense													
				7.5																					
7.0	8.0	6								Dense	20		1.66	Non - Plastic		Nil	0.066	31°32'	0.00	32.67	42.20	50.46	3.67		
	8.5																								
	9.0		16																						
9.0	9.5								Medium																
	10.0																								
10.0		Black Silty Sand (SM-SW)	2.50		10.0	13						Medium	9	1.56	Non - Plastic		Nil	0.097	30°45'	0.00	0.00	33.61	64.75	1.64	

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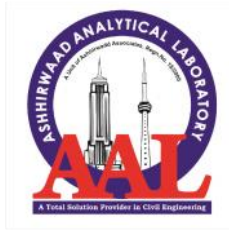
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- ❖ Geotechnical Investigation
- ❖ Survey and contouring
- ❖ Load testing on Piles
- ❖ Structural consultancy
- ❖ Material testing
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Ref: AAL/8209/GT-Report/P.No.1633/Old Port /Pdy/2020-21

Date: 10.09.2020

## GEOTECHNICAL INVESTIGATION REPORT

**PROJECT : GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF MULTI LEVEL CAR PARKING AT OLD PORT , PUDUCHERRY.**

**PROJECT NO : AAL.1633/ OLD PORT /PDY/2020-21.**

**CLIENT : THE CHIEF EXECUTIVE OFFICER,  
PSCDL,  
PUDUCHERRY.**

**REFERENCE : WORK ORDER NO: 1040/PSCDL/MLCP/2020/513 DATE: 11.08.2020**

### **EXPLORATION**

**DATE : 20.08.2020 – 22.08.2020.**

### **DATE OF**

**REPORT : 10.09.2020.**

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Ref: AAL/8209/GT-Report/P.No.1633/Old Port /Pdy/2020-21

Date: 10.09.2020

**NAME OF WORK: GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF  
MULTI LEVEL CAR PARKING AT OLD PORT , PUDUCHERRY.**

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### 9. SITE LAYOUT WITH BORE LOG LOCATIONS

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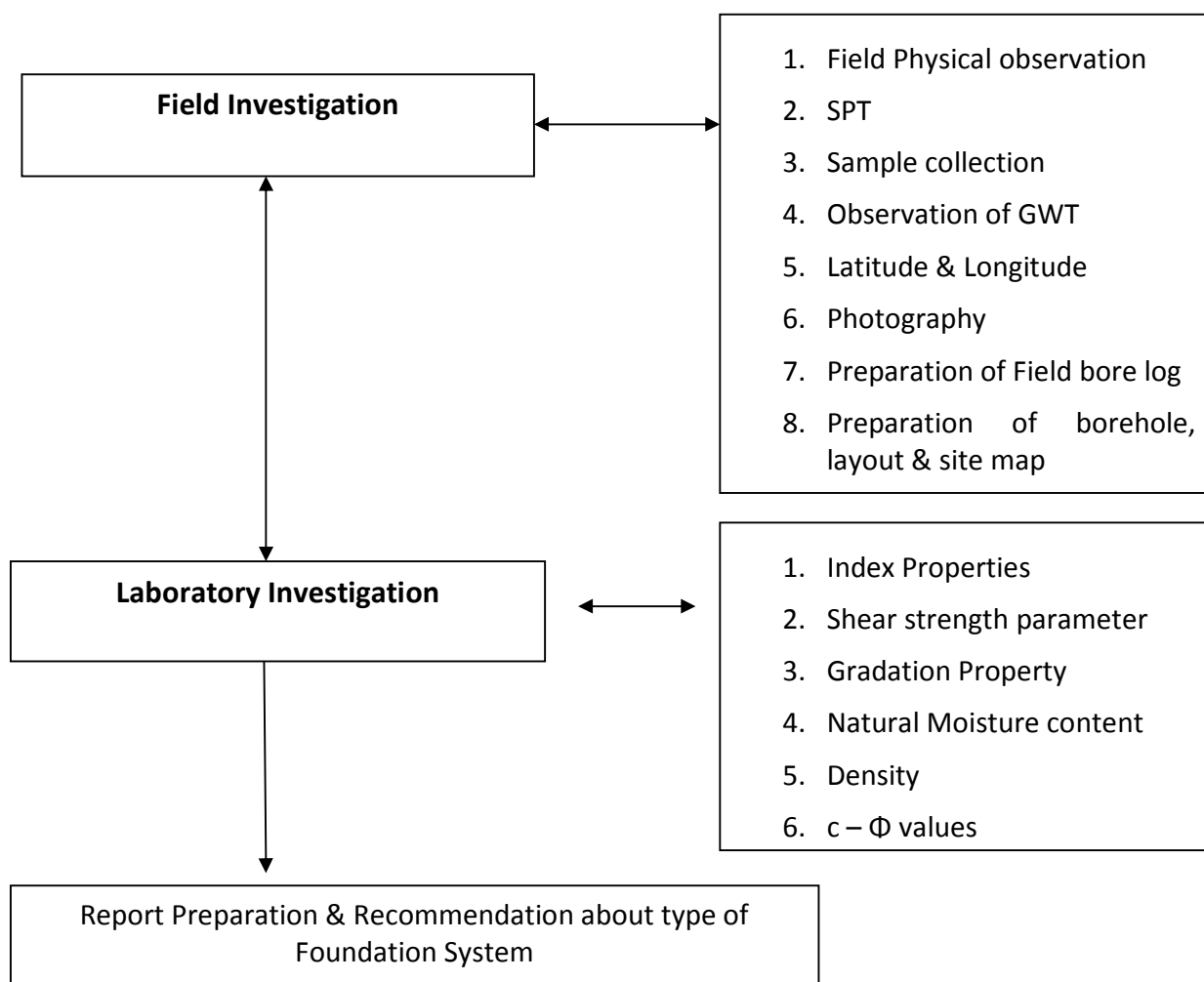
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## 1. INTRODUCTION

A Geotechnical investigation for the above said work was undertaken as per the authorization given by **THE CHIEF EXECUTIVE OFFICER, PSCDL, Puducherry.**

### FLOW CHART



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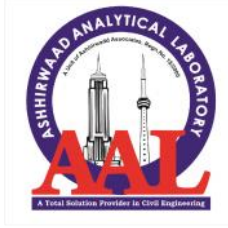
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## **2. SCOPE OF WORK**

**2.1** This geotechnical investigation has been carried out to ascertain the safe bearing capacity and to decide upon suitable foundation system for the proposed structure. It was instructed to make two number of bore holes. The BH -1 & BH-2 was driven upto 10.0m depth and terminated as per the clients instruction.

**2.2** The allowable safe bearing capacity of the soil is calculated based on the field geotechnical investigation, soil properties, GWT and subsequent laboratory experiments.

## **3. FIELD INVESTIGATION**

### **3.1 GENERAL**

Mobilizations of equipment, skilled and unskilled labours are arranged at site. The various factors for the number and position of boreholes and spacing of boreholes are based on the extent of the site, nature and type of structure. Depth of borehole is concluded based on condition of soil, penetration capacity of soil, shear failure and hard strata condition. Standard Penetration Test (SPT) is conducted at various depths. The disturbed soil sample is collected from the site and transported for examination to Ashhirwaad Analytical Laboratory. The field investigation is being monitored by experienced civil engineers/ Geotechnical/ Structural Engineer.

### **3.2 STANDARD PENETRATION TEST (IS: 2131 – 1981)**

#### **EQUIPMENT PREPARATION**

##### **3.2.1 DRILLING EQUIPMENT**

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The equipment used shall provide a clean borehole 100 to 150 mm in diameter, for insertion of the sampler ensure that the penetration test is performed on undisturbed soil and shall permit driving of the split spoon sampler to obtain penetration record and sample in accordance with procedure.

### 3.2.2 DRIVE WEIGHT ASSEMBLY

The drive weight assembly shall consist of driving head and a 63.5 kg weight with 75cm free fall. It is ensured that the energy of the falling weight is not reduced by friction between the drive weight and the guides. The rods to which the sampler is attached for driving should be straight, tightly coupled and straight in alignment. For driving the casting, a hammer heavier than 63.5 kg may be used.

### 3.2.3 CLEANING THE BOREHOLE

In case wash boring is adopted for cleaning the borehole, side discharge bits are permissible, but in no case a bottom discharge bit be permitted. In cohesive soils, the borehole may be cleaned with bailer with a flap valve.

### 3.2.4 OBTAINING THE SAMPLES

Test shall be made at every change in stratum or at intervals of not more than 1.5 m whichever is less. Tests may be made at lesser or greater intervals if specified or considered necessary.

The sampler shall be lowered to the bottom of the borehole. The following information shall be noted and recorded.

- (a) Depth of bottom of borehole below ground level.
- (b) Penetration of the sampler into the soil under the combined weight of sampler and rods

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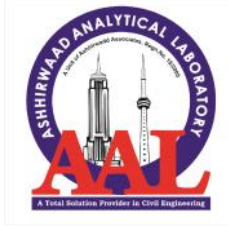
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- (c) Water level in the borehole or casting
- (d) Depth of bottom of casting below ground level.

Labels shall be fixed to the jar or notation shall be written on the covers with the following information:

- a) Origin of sample
- b) Job designation
- c) Boring number
- d) Sample number
- e) Depth of sampling
- f) Penetration record
- g) Length of recovery
- h) Date of sampling

The jars containing samples shall be stored in suitable container for shipment. Samples should not be placed in the sun.

### 3.3 IS CODE FOR FIELD INVESTIGATION

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 1498 – 1970 (Reaffirmed 2007)	Classification & Identification of soil for general engineering purpose (First Revision)
2	IS : 1892 – 1979 (Reaffirmed 2002)	Code of practice for sub surface investigation for foundation (First Revision)
3	IS : 2131 – 1981 (Reaffirmed 2002)	Method of Standard Penetration Test for soil (First Revision)
4	IS : 2132 – 1986 (Reaffirmed 2002)	Code of practice for thin walled tube sampling of soil (Second Revision)
5	IS : 4968 – 1976 (Reaffirmed 2007)	Method of sub surface sounding of soil : Static cone penetration (First Revision)

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## 3.4 SITE EXPLORATION

Subsurface exploration should be carried out in preliminary and detailed exploration. Shear strength and compressibility of the soil is determined in the detailed exploration. The method of boring for soil exploration is rotary boring. Rotary boring is effected by cutting action of the soil. The bit is carried at the end of hollow, jointed drill rods which is rotated by the chuck. A mud laden fluid is pumped continuously and fluid returns to surface in angular space. Undisturbed samples are collected at suitable intervals.

## 3.5 SITE MAP



Bore Hole No	LATITUDE	LONGITUDE
BH-1	11°55'24.09"N	79°49'54.95"E
BH-2	11°55'26.01"N	79°49'55.48"E

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## 3.6 BOREHOLE DETAILS

Two number of bore holes are driven in the field at various location of the site. As per IS: 1892 - 1979 (Reaffirmed 2002), the various driven depth of the borehole, Ground Water Table and their corresponding identifications are tabulated below

SL.NO	BOREHOLE IDENTIFICATION NUMBER	DRIVEN BOREHOLE DEPTH (m)
1.	BH-1	10.0
2.	BH-2	10.0

BOREHOLE IDENTIFICATION NUMBER	GROUND WATER TABLE (m)
BH-1	3.5
BH-2	3.5

## 4. GEOTECHNICAL MODELLING AND OBSERVATION:

### 4.1 GENERAL

Various laboratory test are carried out to assess the soil as per IS code standard and calculations are done. The results of the test are tabulated and interpretation is given.

### 4.2 LIST OF IS CODE

#### 4.2.1 LABORATORY IS CODE

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 2720 – 1983 (Part – 1) (Reaffirmed 2006)	Methods of test for soil :Preparation of dry soil sample for various test (Second Revision)
2	IS 2720 – 1980 (Part – 2) (Reaffirmed 2010)	Methods of test for soil : Determination of water content (Second Revision)

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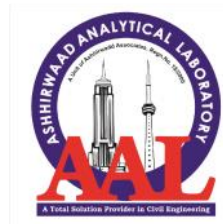
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3	IS 2720 – 1980 (Part – 3) (SECTION – 1) (Reaffirmed 2002)	Methods of test for soil : Determination of specific gravity : Fine grained soil (First Revision)
4	IS 2720 – 1980 (Part – 3) (SECTION – 2) (Reaffirmed 2002)	Methods of test for soil : Determination of specific gravity : Fine, Medium, Coarse grained soil (First Revision)
5	IS 2720 – 1985 (Part – 4) (Reaffirmed 2006)	Methods of test for soil : Grain size analysis(Second Revision)
6	IS 2720 – 1985 (Part – 5) (Reaffirmed 2006)	Methods of test for soil : Determination of liquid and plastic limit (Second Revision)
7	IS 2720 – 1985 (Part – 15) (Reaffirmed 2006)	Methods of test for soil : Determination of consolidation properties (First Revision)
8	IS 1809 – 1972 (Reaffirmed 2006)	Methods of test for soil : Glossary of terms & symbols relating to soil engineering (Third Revision)

## 4.2.2 FOUNDATION IS CODE

SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS : 1080 – 1986 (Reaffirmed 2002)	Code of practice for design and construction of shallow foundation on soil (other than raft, ring and shell) (Second Revision)
2	IS 1904 : 1968 (Reaffirmed 2006)	Code of practice for design and construction of foundation on soil :General requirement (Third Revision)
3	IS 6403 – 1981 (Reaffirmed 2002)	Code of practice for determination of bearing capacity of shallow foundation (First Revision)

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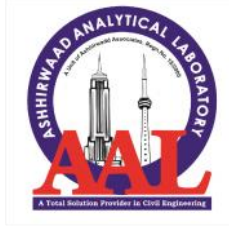
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## 4.2.3 SEISMIC IS CODE

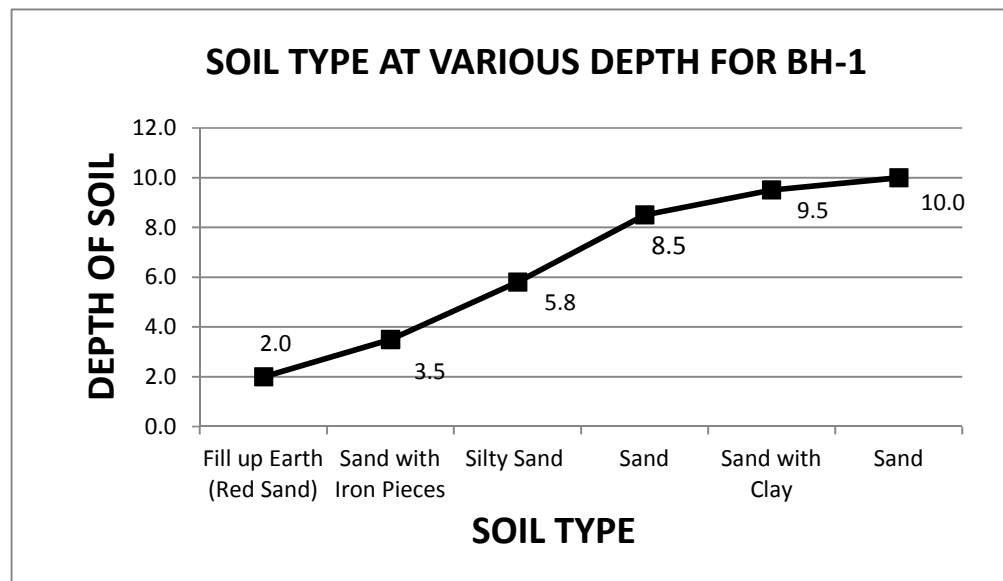
SL.NO	IS CODE NUMBER	IS CODE NAME
1	IS 1893 – 2002 (Reaffirmed 2007)	Criteria for Earthquake Resistant design of Structures(Fifth Revision)

## 4.3 RESULT:

Laboratory tests the following soil profiles for the boreholes as observed is detailed below:

### BH -1

The details of soil stratification are presented in the bore - log and their interpretation is shown below



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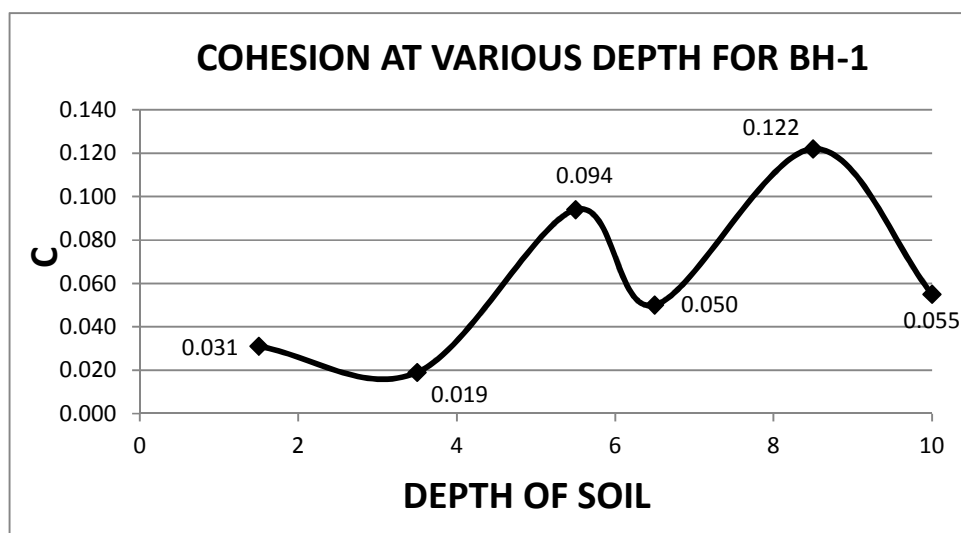
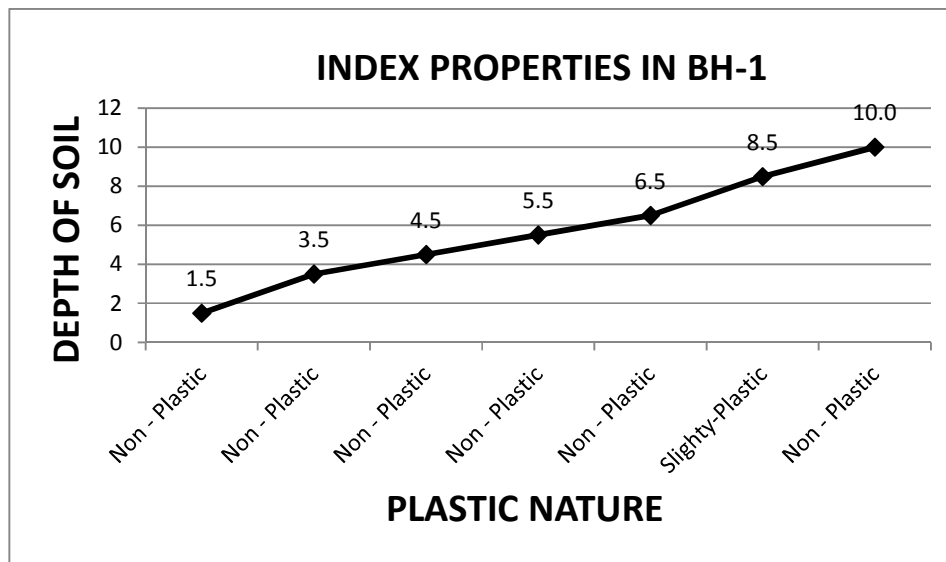


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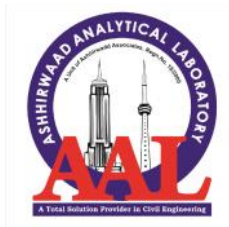
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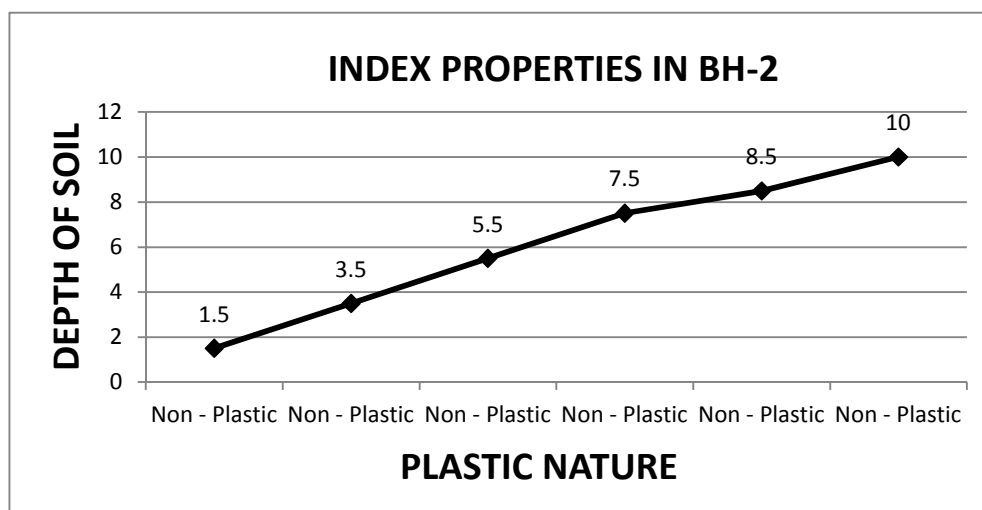
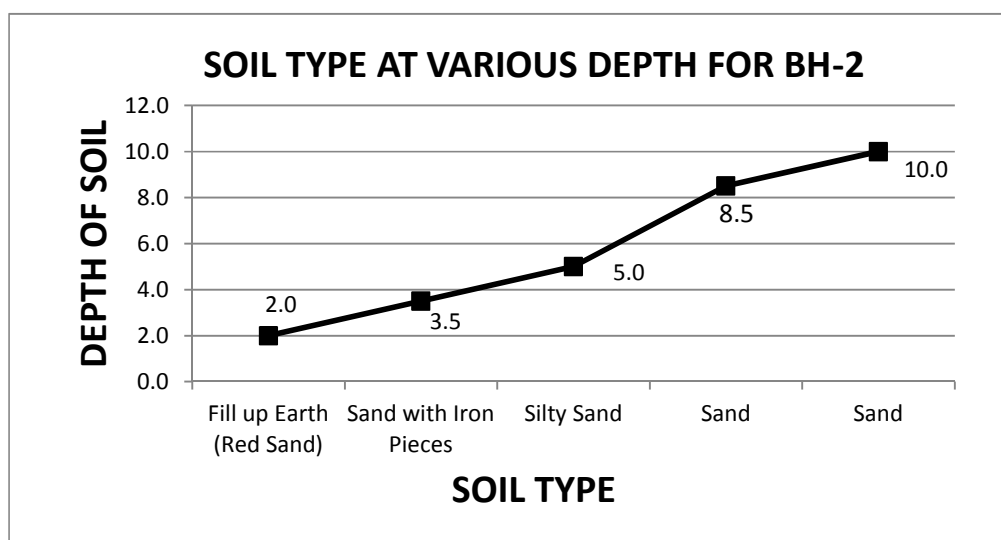
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## BH -2

The details of soil stratification are presented in the bore - log and their interpretation is shown below



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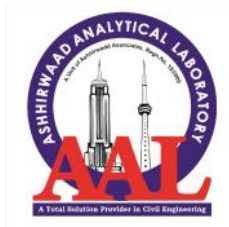
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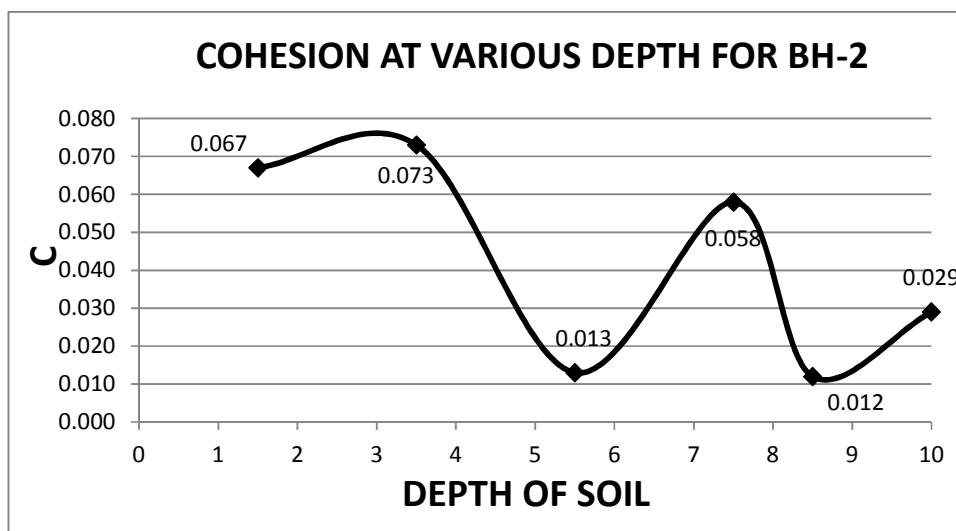
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## 5. CHEMICAL TEST:

Chemical tests were performed on water samples collected from bore holes for determining pH value and chloride. The results are given in a tabular form below:

**Table 5.1**  
**As per IS 3025 (Part 11 & 32), IS 456-2000.**

SL.NO	Particulars	Results	Stipulations of IS 456-2000, IS 3025(Part 32) (Water for Construction Purpose)
1.	pH value	9.2	6.5 – 8.5
2.	Chloride (Cl)	842.5mg/l	500 (for RCC) - 2000 mg/l (for PCC)

It is seen that the pH value is exceeds the permissible limit (As per IS 456-2000). So the necessary precaution will be made for foundation concrete to prevent the excessive corrosion of steel and cracks in concrete.

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## 6. RECOMMENDATIONS:

The following recommendations are made based on the field investigations SPT values, GWT and subsequent Laboratory Experiments.

**6.1** Considering in situ condition of the soil Strata, two types of foundations are suggested for the **Proposed Construction Of Multi Level Car Parking at Old Port, Puducherry.**

- a) Isolated/Combined Footing
- or
- b) Strip Raft Foundation

**Note:** Filled up Earth Formation was seen in the Bore Hole Locations upto a maximum Depth of 3.50m from the NGL. Hence Footing have to be founded over/Medium to Dense Layer available beyond 3.50m.

**6.2** If **"ISOLATED/COMBINED FOOTING"** is considered, the allowable safe bearing capacities are calculated and tabulated below along with the allowable settlement.

**Table 6.2.1.1**

**Safe Bearing Capacity Calculation As per IS 6403:1981**

Sl. No.	Bore Hole No	Depth in meter from NGL	SBC in T/m <sup>2</sup>	As per IS:1904-1986 (Reaffirmed 2006)	
				Total Arrived Settlement (mm)	Total Arrived Settlement (mm)
1.	BH-1 &	3.75	14	6.12	50
2.	BH-2	4.0	16	6.76	50

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## 6.2 B

**6.2.1** If "STRIP RAFT FOUNDATION" is considered, the allowable safe bearing capacities are calculated and tabulated below along with the allowable settlement.

**Table 6.2.1.1**

Sl. No.	Bore Hole No	Depth in meter from NGL	SBC in T/m <sup>2</sup>	As per IS:1904-1986 (Reaffirmed 2006)	
				Total Allowable Settlement (mm)	Total Allowable Settlement (mm)
1.	BH-1 &	3.75	16	6.81	75
2.	BH-2	4.0	18	6.99	75

**\*NGL –Natural Ground Level**

**6.2.2** The Decision of selecting the suitable type and depth of foundation rests with the Structural Engineer Concerned.

**6.2.3** The width of footing should not be less than 1.5m in order to satisfy the stability requirements.

**6.3 SAFETY PRECAUTIONS:** Since the **GWT** is located at 3.50m depth, during construction, adequate safety measures should be taken for the safety of adjacent structures by controlled and constant dewatering with sufficient support measures for prevention of the sliding soil mass. The safety of the men, machineries and structure should be ensured.

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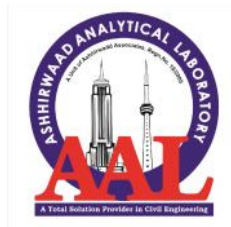
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**6.4** For the sub structure [RCC] the environmental exposure condition may be considered as '**Severe**' and all the precautions as laid by the relevant code of practice for the design of structures may be adopted.

**6.5** The entire recommendations as above are based on two bore holes executed as per the Clients directions at the location shown by the client's representative as per terms of reference. The uniformity or otherwise of the soil delineation and strength profile over the entire site shall be verified during execution. If there are any variations the same shall be reported to us for review and further advice.

sd/-

**Er. N.J.L. RAMESH**

CHIEF CONSULTANT (Geotech& Structures)

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**Date : 10.09.2020**

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## 7.APPENDICES

### 7.1 SAFE BEARING CAPACITY CALCULATIONS:

**7.1.1** For Shallow foundation it is as per **IS: 1904 – 1995**, *Code of practice for design and construction of foundations*: General requirements (third revision). The recommended safe bearing Capacity of soil for shallow foundation was calculated as per **IS: 6403-1981**, *Code of practice for Determination of Bearing Capacity of Shallow Foundation*. The settlement calculations are as per **IS: 8009 (Part-I) - 1976**, *Code of practice for calculation of settlements in foundations, part I Shallow foundation subjected to symmetrical static vertical Loads*. All the calculations are carried out based on the SPT value observed from the field.

### 7.2. SAFE BEARING CAPACITY CALCULATION FORMULAE:

#### 7.2.1 FOR SHALLOW FOUNDATION:

IN CASE OF GENERAL SHEAR FAILURE AS PER IS: 6403: 1981

$$\text{The Ultimate Net Bearing Capacity } q_d = c N_c s_c d_c i_c + q (N_q - 1) s_q d_q i_q + 0.5 B \gamma N_\gamma s_\gamma d_\gamma i_\gamma W'$$

$$\text{Safe Load Carrying Capacity} = q_d / F.S$$

#### DEPTH FACTOR

$$d_c = 1 + (0.2 D_f / B \sqrt{N_\phi})$$

$$d_q = d_\gamma = 1 \text{ for } \phi < 10^\circ$$

$$d_q = d_\gamma = 1 + 0.1 D_f / B \sqrt{N_\phi} \text{ for } \phi > 10^\circ$$

#### INCLINATION FACTOR

$$i_c = i_q = (1 - \alpha / 90)^\alpha$$

$$i_\gamma = (1 - \alpha / \phi)^\alpha$$

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## SHAPE FACTOR

Sl. No.	Shape of Base	$s_c$	$s_q$	$s_\gamma$
i)	Continuous strip	1.00	1.00	1.00
ii)	Rectangle	$1 + 0.2 B/L$	$1 + 0.2 B/L$	$1 - 0.4 B/L$
iii)	Square	1.3	1.2	0.8
iv)	Circle	1.3	1.2	0.6

Where,

<b>c</b>	= Cohesion in Kg/cm
<b><math>D_f</math></b>	= Depth of foundation in cm
<b><math>d_c, d_q, d_\gamma</math></b>	= Depth factors
<b><math>i_c, i_q, i_\gamma</math></b>	= Inclination factors
<b>L</b>	= Length of footing in cm
<b><math>L'</math></b>	= Effective length of footing in cm
<b>N</b>	= Corrected standard penetration value
<b><math>N_c, N_q, N_\gamma</math></b>	= Bearing capacity factors
<b><math>N_\phi</math></b>	= $\tan^2 (\pi/4 + \phi/2)$
<b>q</b>	= Effective surcharge at the base level of Foundation
<b>qd</b>	= Net ultimate bearing capacity based on general shear failure
<b><math>W'</math></b>	= Correction factor for location of water table
<b><math>\alpha</math></b>	= Inclination of the load to the vertical in degrees
<b><math>\phi</math></b>	= Angle of shearing resistance of soil in degrees
<b><math>\gamma</math></b>	= Bulk unit weight of foundation soil
<b>F.S</b>	= Factor of safety.

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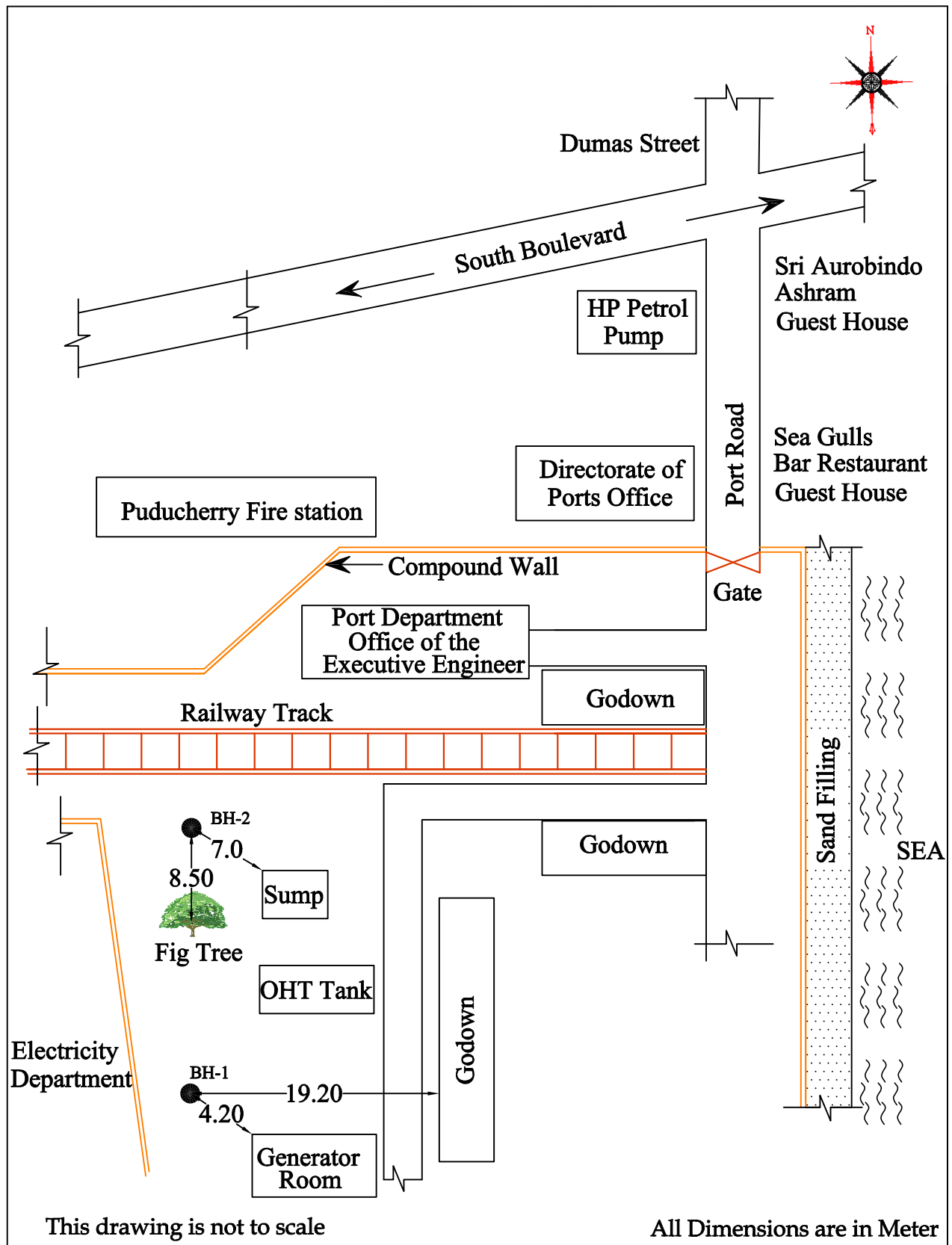


**Fig. 1 – Site Photo Showing the Soil Exploration Work.**

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### Borehole Layout



Name Of The Work : Geotechnical Investigation For The Proposed Construction Of Multi Level Car Parking at Old Port, Puducherry.

ASHHIRWAAD ANALYTICAL LABORATORY, PUDUCHERRY  
(NABL Accredited Laboratory - TC-8619)



ULR : TC861920000000276F

BORE LOG - 1/2

Project No:		AAL.1633/Pdy/2020	Date:	20.08.2020		Location:	Old Port , Puducherry.						Index properties (%)					Shear strength parameters		Gradation properties (%)								
BH. No :		1	GWT (m):	3.50		Graphical Representation of  Standard Penetration Test Data (N)						Description /consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> )	Plastic limit (W <sub>p</sub> )	Plasticity index(I <sub>p</sub> )	Consistency index (I <sub>c</sub> )	Free swell index(Cs)	Direct shear test		Sieve analysis						
Depth of boring (m) :		10.00		Thickness of Layer (m)	Depth of Sampling(m)															N Value	10	20	30	40	50	C (kg/cm <sup>2</sup> )	$\phi$ (degrees)	Gravel
Depth Below GL	Soil stratum	Classification of soil	UDS		DS																							
1.0		Fill up earth Sand (SP)	2.00		0.5	4						Very loose																
					1.0																							
2.0					1.5												14	1.61	Non - Plastic			Nil	0.031	31°10'	0.00	0.00	46.42	53.58
					2.0	30							Medium															
3.0	Fill up earth Black sand (SW) with iron Pieces	1.5	2.5																									
			3.0																									
4.0			3.5		4									21	1.69	Non - Plastic			Nil	0.019	30°45'	0.00	1.19	24.11	71.94	2.77		
		Dark brown Silty sand (SM-SW)	2.30		4.0	5							Loose															
5.0					4.5																							
					5.0																							
6.0					5.5	22							Medium	19	1.72	Non - Plastic			Nil	0.094	31°10'	1.45	1.74	31.40	64.24	1.16		
					6.0	50 <sub>(10cm1)</sub>								Very Dense														
7.0	Light Brown Sand (SP)	2.10	6.5												18	1.82	Non - Plastic			Nil	0.054	31°32'	0.00	0.00	55.80	42.39	1.81	
			7.0																									
8.0			7.5		50 <sub>(8cm1)</sub>																							
					8.0	5							Loose															
					8.5										28	1.59	Slightly Plastic			20	0.122	14°11'	0.00	2.20	57.88	27.47	12.45	
9.0	Sand (SW) with clay	1.00	9.0																									
			9.5																									
10.0					Black sand (SW)	0.50	10.0	11							Medium	17	1.72	Non - Plastic			Nil	0.055	31°25'	1.47	3.67	51.1	42.3	1.47

Project No: AAL.1633/2020

"A Total Solution Provider in Civil Engineering"

Name Of The Work : Geotechnical Investigation For The Proposed Construction Of Multi Level Car Parking at Old Port, Puducherry.

ASHHIRWAAD ANALYTICAL LABORATORY, PUDUCHERRY  
(NABL Accredited Laboratory - TC-8619)



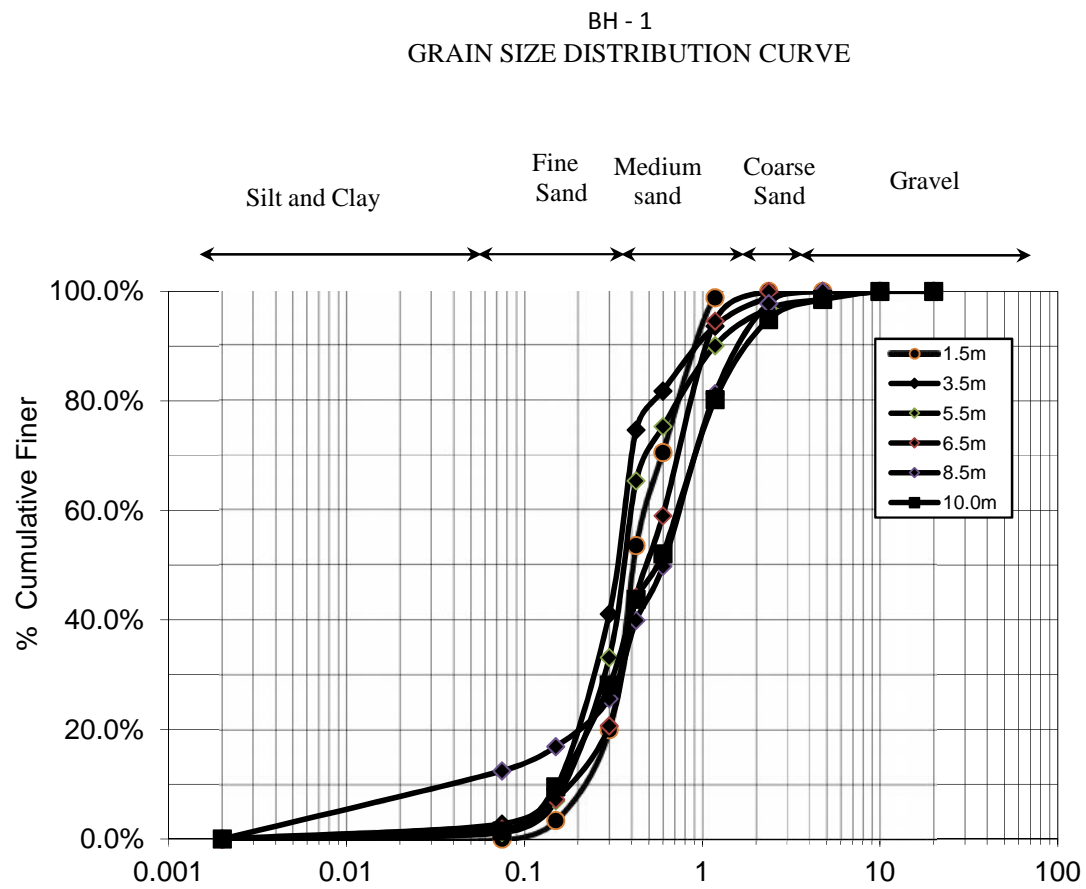
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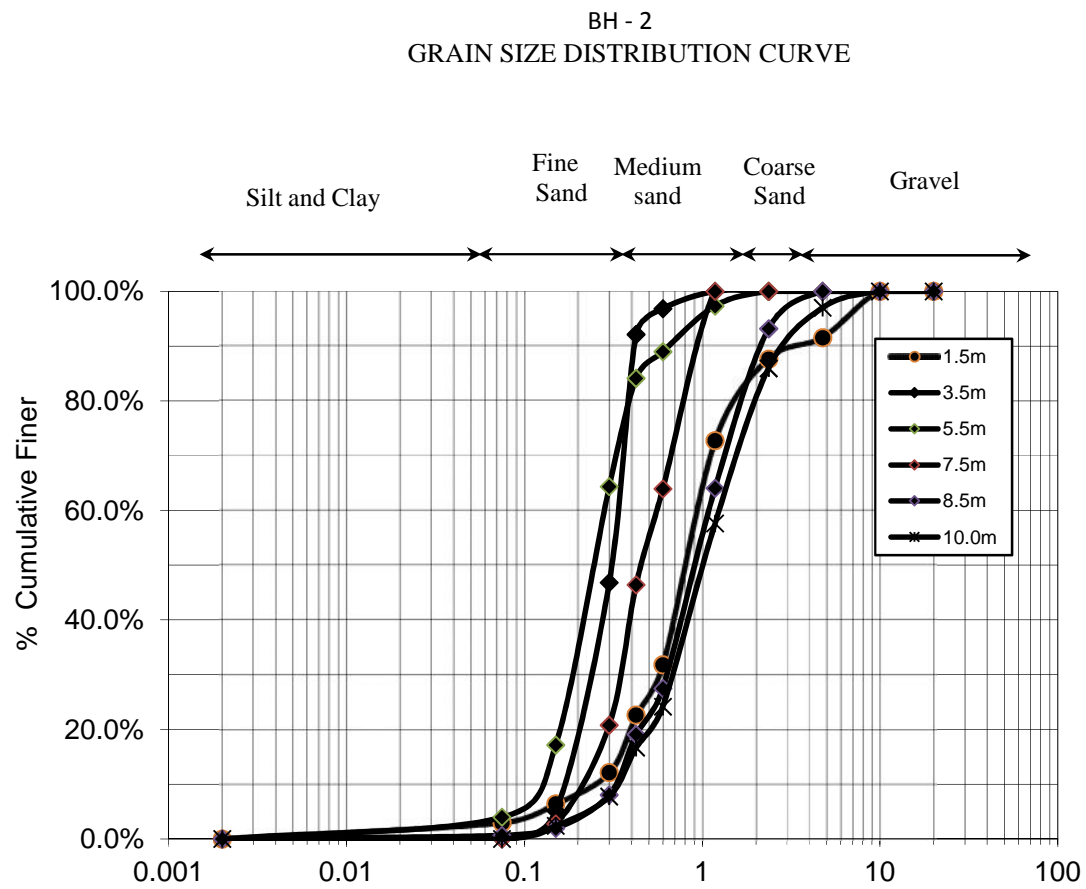
BORE LOG - 2/2

Project No:		AAL.1633/Pdy/2020		Date:		22.08.2020		Location:		Old Port , Puducherry.						Index properties (%)					Shear strength parameters		Gradation properties (%)									
BH. No :		2		GWT (m):		3.50		Graphical Representation of Standard Penetration Test Data (N)					Description /consistency	Natural moisture content (%)	Density ( $\gamma$ ) t/m <sup>3</sup>	Liquid limit (W <sub>L</sub> )	Plastic limit (W <sub>p</sub> )	Plasticity index(I <sub>p</sub> )	Consistency index (I <sub>c</sub> )	Free swell index(C <sub>s</sub> )	Direct shear test		Sieve analysis									
Depth of boring (m) :		10.00		Thickness of Layer (m)		Depth of Sampling(m)															C (kg/cm <sup>2</sup> )		$\phi$ (degrees)		Gravel	Coarse sand	Medium sand	Fine sand	silt & clay			
Depth Below GL	Soil stratum	Classification of soil		Thickness of Layer (m)		UDS		DS		N Value		10	20	30	40	50																
1.0		Fill up earth Red Sand		2.00				0.5																								
								1.0																								
2.0								1.5																								
								2.0																								
3.0		Fill up earth Black Sand with iron Pieces		1.50				2.5																								
								3.0																								
4.0								3.5				12								Medium	21	1.63	Non - Plastic		Nil	0.073	30°45'	0.00	0.00	7.87	92.13	0.00
	5.0	Light Brown Silty Sand (SM-SW)		1.50				4.0																								
4.5								20																								
		Light Brown Sand (SP)		3.50				5.0																								
6.0								5.5				54								Very Dense	16	1.72	Non - Plastic		Nil	0.013	31°10'	0.00	0.00	15.86	80.18	3.96
									6.0			50 <sub>(6cm<sup>f</sup>)</sub>																				
7.0								6.5																								
8.0		Black Sand (SW)		1.50				7.0																								
								7.5				50 <sub>(9cm<sup>f</sup>)</sub>																				
9.0								8.0																								
								8.5				17								Medium	13	1.58	Non - Plastic		Nil	0.012	30°45'	0.00	6.80	74.11	18.45	0.65
								9.0																								
10.0								9.5																								
								10.0				10								Loose	17	1.79	Non - Plastic		Nil	0.029	31°10'	2.99	11.04	69.25	16.72	0.00

Project No: AAL.1633/2020

"A Total Solution Provider in Civil Engineering"





a. Height of Mast ( Mtrs ).	: 12.5
b. Material of Construction.	: BSEN 10025 or Equivalent
c. Thickness of Material	
i. Top Section.	: 3 mm
ii. Middle Section.	: -----
iii. Bottom Section.	: 4 mm
d. Cross Section of Mast ( Number of Sides )	: 12 Sided Polygon
e. Length of Individual Section.	
i. Top Sec.	: 6.5 Mtrs
ii. Middle Sec.	: -----
iii. Bottom Sec.	: 6.5 Mtrs
f. Base & Top Diameter	
i. Base Dia.	: 340 mm(Approx)
ii. Top Dia.	: 150 mm(Approx)
g. Type of Joints	: Stress Slip Fit Joints
h. Length of Overlap.	: 1.5 times the Dia of Insertion
i. Metal Protection Treatment	: Hot Dip Galvanised as per BS 729 or equivalent
j. Thickness of Galvanisation.	: Average 70 Microns
k. Size of Door Opening at Base of Mast,	: 900 mmX 250 mm
l. Type of Locking on Door Panel.	: Close fitting door with Allen Key Locking with suitable reinforcement to Avoid Buckling at Base of Mast.

# Crompton

m. Lighting protection finial	: GI single spike of Length 1200 mm
n. Size of Base Plate.	
i. Diameter.	: 540 mm
ii. Thickness.	: 30 mm
<b>2 <u>Dynamic Loading As Prevailing At Site.</u></b>	
a. Maximum Wind Speed ( IS 875 - 1987 )	: 180 Km/Hr
b. Number of Foundation Bolts.	: 06 Nos
c. PCD of Foundation Bolts.	: 440mm
d. Diameter of Foundation Bolts.	: M24
e. Length of Foundation Bolts	: 850 mm
<b>3 <u>Lantern Carriage.</u></b>	
a. Material of Construction.	: 40 NB ERW Class B- M.S Pipe
b. Diameter of Lantern Carriage Ring.	: 600 mm (ID)
c. Construction.	: 5 Arm Welded
d. Number of Joints.	: 2 Segments
e. Load Carrying Capacity.	: <b>10 Luminaire , Asymmetrical</b>
<b>4 <u>Winch.</u></b>	
a. Number of Drums Per Winch.	: Double Drum.
b. Gear Ratio.	: 50 : 1
c. Capacity	: SWL 350 Kgs.
d. Method of Operation.	: Motor OR Manual.
e. Lubrication Arrangement.	: Self Lubricating in Permanent Oil Bath
f. Type of Lubricant.	: SAE - 90 / 140.

# Crompton

## 5 Stainless Steel Wire Rope

- |                            |                             |
|----------------------------|-----------------------------|
| a. Grade                   | : AISI 316.                 |
| b. Diameter of SS Rope     | : 6 mm                      |
| c. Construction of SS Rope | : 7 / 19.                   |
| d. Number of SS Ropes      | : Two Wire Rope System      |
| e. Thimbles & Terminals.   | : Provided.                 |
| f. Breaking Load Capacity. | : 2350 Kgs Per SS Wire Rope |

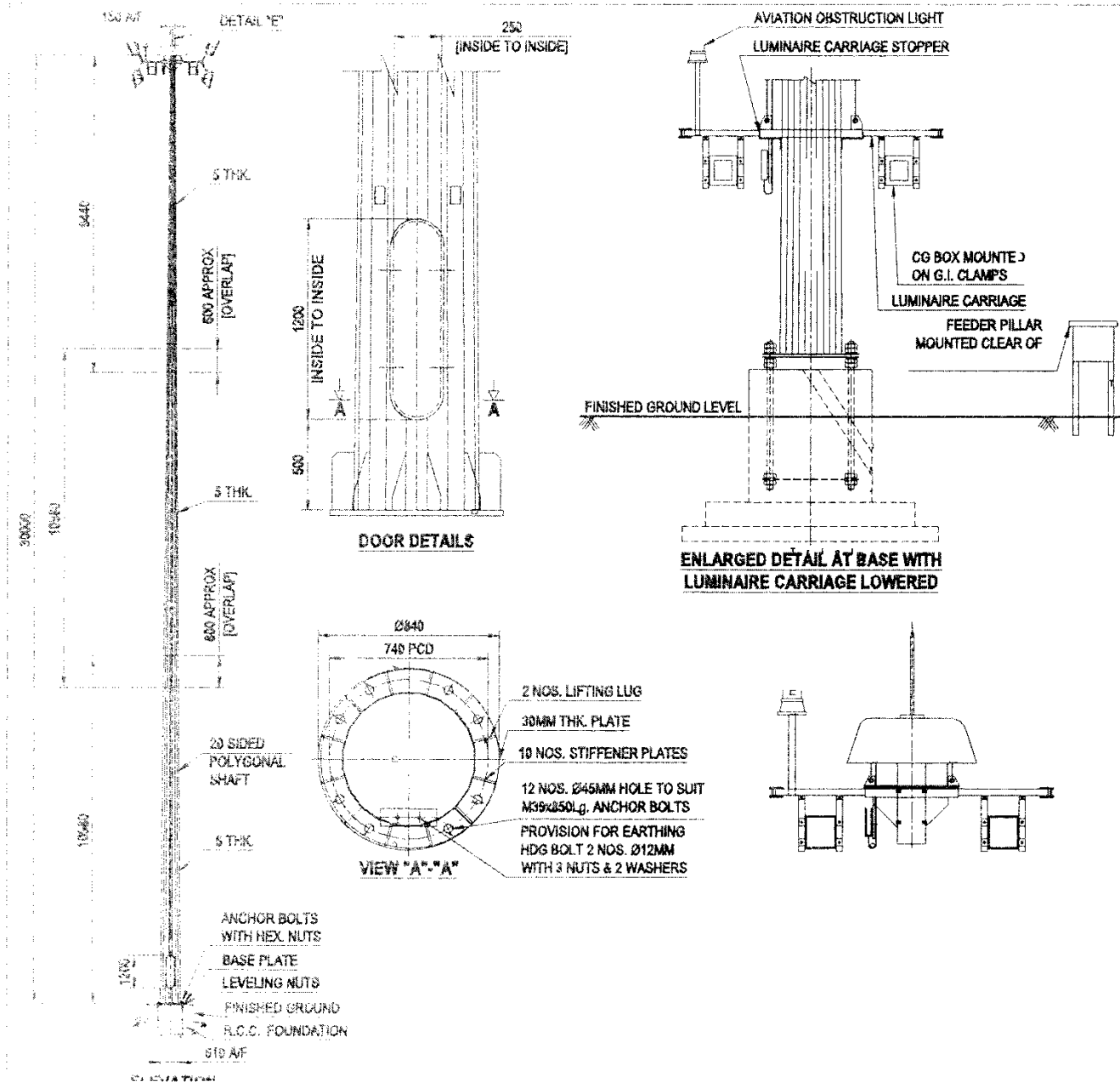
## 6 Trailing Cable.

- |                            |                                    |
|----------------------------|------------------------------------|
| a. Type                    | : Flexible Copper 5 Core 4 Sq mm   |
| b. Material.               | : EPR Insulated PCP Sheathed / PVC |
| c. Make .                  | : I.S. Approved Brand.             |
| d. No.of circuits per mast | : One                              |

## 7 Power Tool.

- |                                   |                          |
|-----------------------------------|--------------------------|
| a. Model.                         | : Integral               |
| b. Capacity(HP)                   | : 1.5 HP                 |
| c. Number of Speeds.              | : Single Speed.          |
| d. Reversible / Non - Reversible. | : Reversible.            |
| e. Input Supply.                  | : 415 Volts / 240 Volts. |

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED

**NOTES :-**

1. ALL DIMENSIONS ARE IN M.M.
2. DESIGN STANDARD I.L.E TECHNICAL REPORT NO. 7.
3. DESIGN CRITERIA :
  - 3.1. BASIC WIND SPEED - IS : 875 PART III : 1987
  - 3.2. DESIGN LIFE - 25 YEARS.
  - 3.3. TERRAIN CATEGORY - 2
  - 3.4. TOPOGRAPHY - FLAT
4. MATERIALS :
  - 4.1. SHAFT/GUSSETS : S355 AS PER BS EN 10025.
  - 4.2. FLANGE/DOOR STIFFENER : AS PER IS-2062.
  - 4.3. FOUNDATION BOLTS : T.S. 500 N/Sq.mm Y.S.-405 N/Sq.mm.
5. FINISHING : HOT DIP GALVANIZED TO BS EN ISO 1461.
6. THE TOLERANCE IN A/F DIMENSION ARE  $\pm 3$ mm.
7. THE A/F DIMENSIONS ARE OUTSIDE TO OUTSIDE.
8. THE DOOR SHALL BE VANDAL PROOF AND WEATHER PROTECTED
9. THE MAST WILL HAVE PADLOCKING ARRANGEMENT IN THE CENTER AND 2 Nos ALLEN BOLT AT TOP AND BOTTOM.

NOT TO SCALE

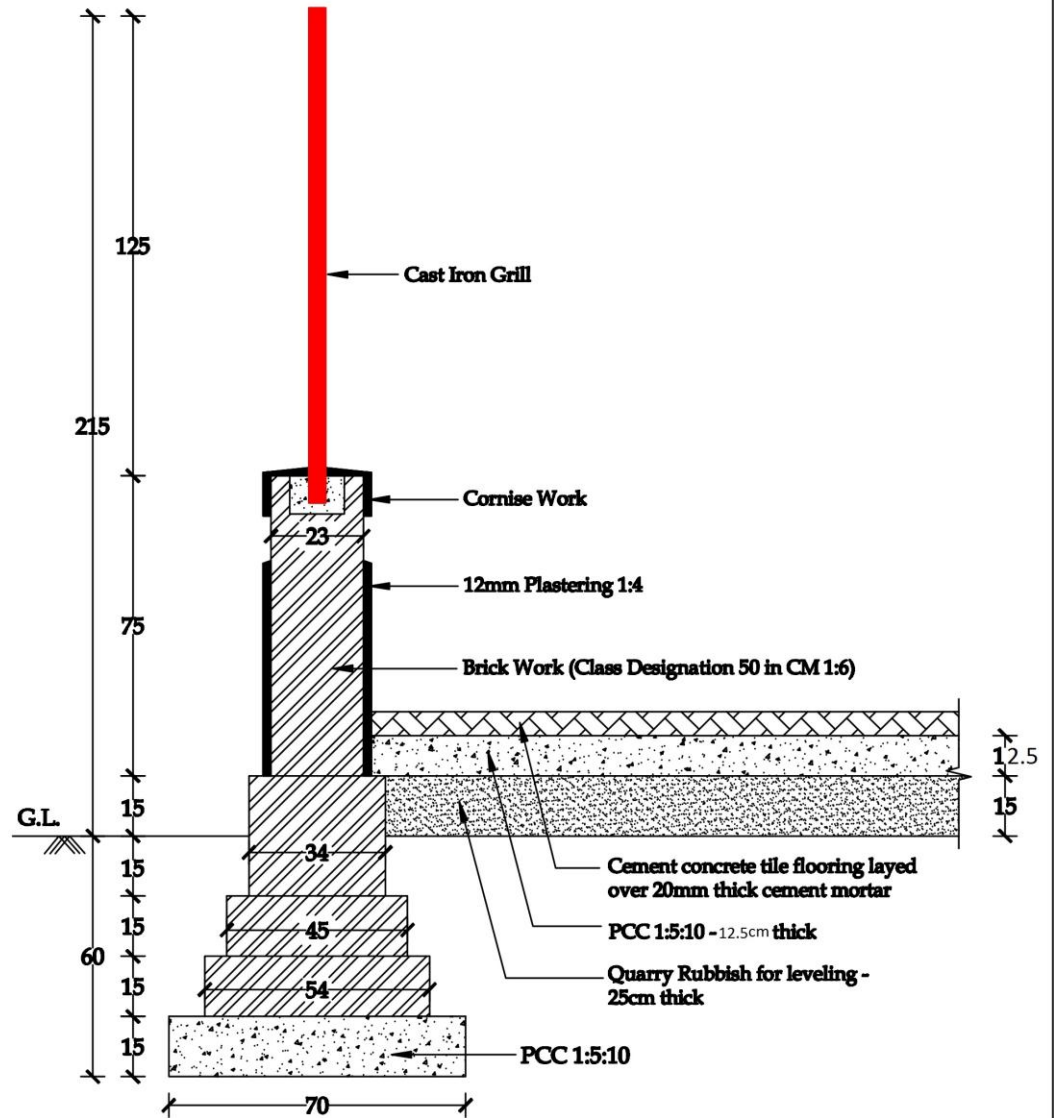
GOVERNMENT OF PUDUCHERRY  
PUBLIC WORKS DEPARTMENT  
PUDUCHERRY

HIGH MAST LIGHT SUPER STRUCTURE



Name of Work: - Proposed Construction of Compound wall & Paver Block Flooring for MLCP at old Jail Campus in JN Street, Puducherry.

DRAWING 1



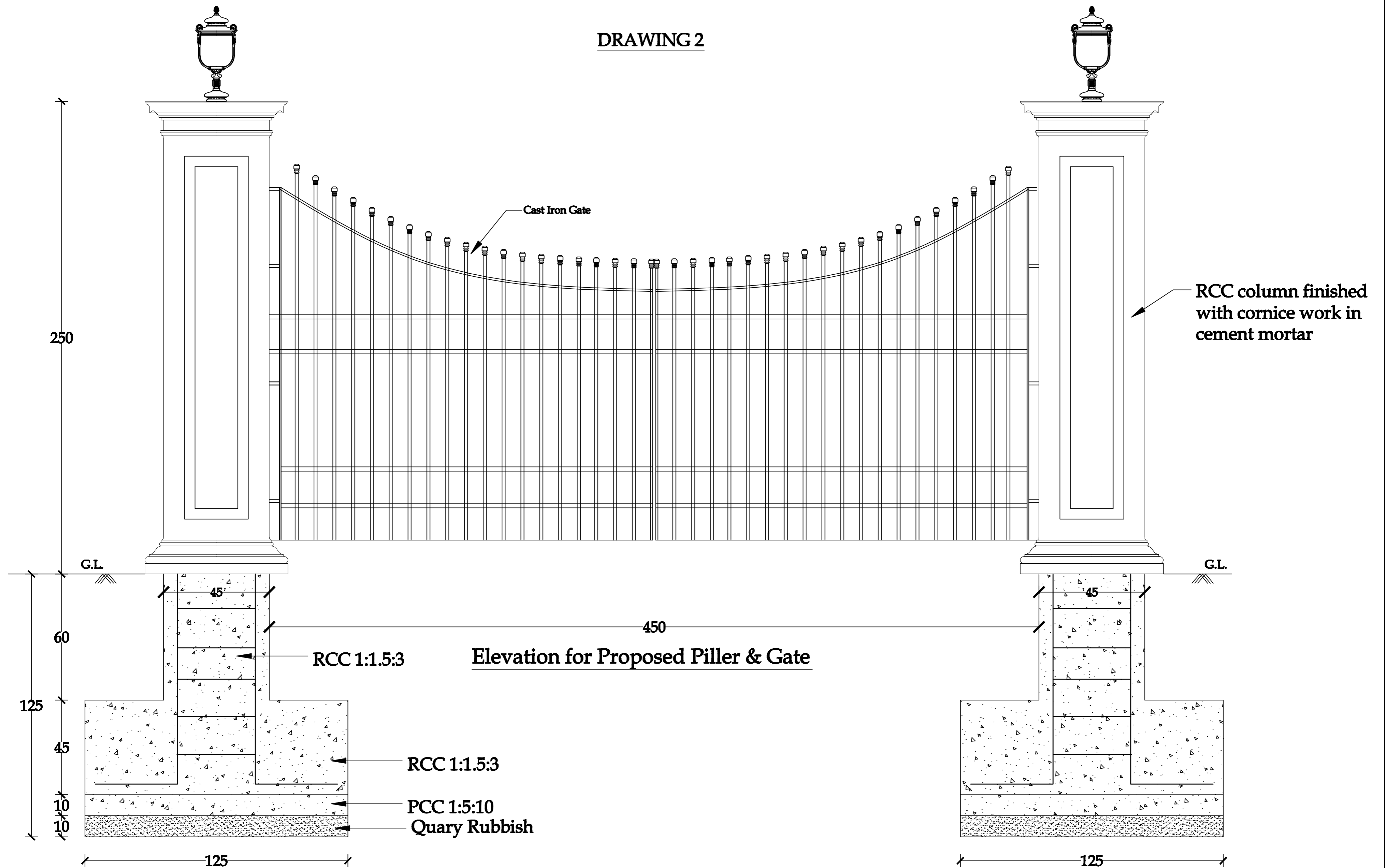
Cross Section for Compound Wall & Paver Block Flooring

Not to Scale  
All dimension in cm



Name of Work: - Proposed Construction of Gate for MLCP at old Jail Campus in JN Street, Puducherry.

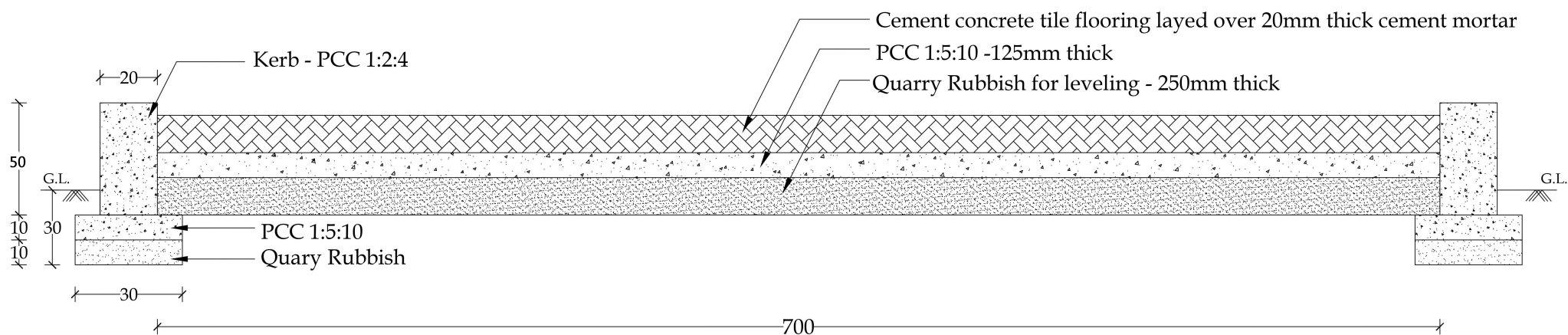
DRAWING 2



Not to Scale  
All dimension in cm

## Cross Section of Cement Concrete Tile Flooring along with Kerb Wall for MLCP

DRAWING 3



Not to Scale  
All dimension in cm