TENDER DOCUMENT FOR

Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I

NIT No. WAP/CMU-III/2025-26/SSB/Araria/12

Date: 04-08-2025

Volume-I
TECHNICAL PROPOSAL

WAPCOS LIMITED
CONSTRUCTION MANAGEMENT UNIT- III
1st Floor, NPCC, BUILDING, PLOT NO. 148,
SECTOR-44, GURUGRAM-122003, HARYANA

August 2025

DISCLAIMER

Sashastra Seema Bal (SSB), A Cental Armed Paramilitary Force (CAPF) under Ministry of Home Affairs, Government of India, has engaged WAPCOS Limited as Project Management Consultant for Construction & Development of Infrastructure Works at various formations of SSB in India. This Tender Document has been prepared to give information on the Project to the interested Bidders. The information is provided to Bidders on the terms and conditions set-out in this document and any other terms and conditions subject to which such information is provided.

The purpose of this document is to provide Bidders with information to assist the formulation of their bid. The information is not intended to be exhaustive. Bidders are required to make their own inquiries and respondents will be required to confirm in writing that they have done so and they do not rely solely on the information in the document.

The information is provided on the basis that it is non-binding on SSB / WAPCOS Limited, any of its authorities or agencies or subsidiaries or any of their respective officers, employees, agents or advisors.

Information provided in this document to the Applicants is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. WAPCOS accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on the law expressed herein.

SSB / WAPCOS Limited reserve the right to not proceed with the Project or to change the configuration of the Project, to alter the timetable reflected in this document or to change the process or procedure to be applied. It also reserves the right to decline to discuss the Project further with any party submitting the Bid.

While WAPCOS Limited have taken due care in the preparation of the information contained herein and believe it to be accurate, neither SSB nor WAPCOS Limited, any of its authorities or agencies nor any of their respective officers, employees, agents or advisors gives any warranty or make any representations, express or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it.

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NOTICE INVITING TENDER (NIT)

NOTICE INVITING TENDER (NIT)

NIT No. WAP/CMU-III/2025-26/SSB/Araria/12 **Date : 04-08-2025**

WAPCOS Limited (A Govt. of India Undertaking) as Project Management Consultant (PMC) on behalf of Sashastra Seeme Bal (SSB), invites **Online e-Tenders on Engineering Procurement & Construction (EPC)** mode from experienced and competent bidders, meeting prescribed qualifying criteria as mentioned in tender document:

a)	Name of Work / Project	:	**Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I**
b)	Site / Location	:	52nd SSB Battalion, Araria, Bihar
c)	Website for viewing tender, Corrigendum/ Addendum, if any.	:	www.wapcos.co.in & www.etenders.gov.in/eprocure
d)	Website for Registration/ uploading of Tender	:	www.etenders.gov.in/eprocure
e)	Estimated Cost of Work	:	Rs. 50,22,50,597/- (Excluding GST)
f)	Cost of Tender Document	:	Rs. 11,800/- including GST (in form of Demand Draft in favour of WAPCOS LIMITED payable at New Delhi).
g)	Bid Security / EMD / Insurance Surety Bonds.	:	Rs. 60,22,506/- (Refundable) in the form of RTGS/ NEFT/ D.D./ Banker's cheque/ Insurance Surety Bonds/ FDR in favor of 'WAPCOS Limited' payable at Gurugram, Haryana. OR A part of earnest money is acceptable in the form of bank guarantee also. In such Rs. 20,00,000/- have to be deposited in form RTGS/NEFT/DD/ Banker's Cheque/FDR and balance Rs. 40,22,506/- can be accepted in form of bank Guarantee in prescribed format issued by a scheduled bank which shall remain valid up to one year from date of submission of tender including extensions, if any. The bank account as per details: Name of Bank: Indian Overseas Bank Bank Account Number: 193502000000405 IFSC Code: IOBA0001935 Branch Name: National Horticulture Board (NHB) Building, G-85, Industrial Area, Sector-18, Gurugram-122015, Haryana
h)	Solvency Certificate	:	Rs. 20.09 Cr. in original from a Nationalized/ Scheduled Commercial Bank approved by Reserve Bank of India (RBI). The Certificate should be issued between the publishing of NIT & last date of submission of Bids, including extensions if any and shall be addressed to WAPCOS Limited, 76-C, Institutional Area,

			Sector-18, Gurugram, Haryana quoting the name of the work. The certificate should carry name, designation of the bank official, who has the authority to issue Solvency Certificate. Note: This Certificates will be verified from the issuing authority by WAPCOS.
i)	Project Completion Period	:	24 Months followed by 2(Two) years of Defect Liability Period.
j)	Validity of Bid/Tender	:	90 Days from the Date of opening of Tender.
k)	Site Visit (Desirable)	:	**10-08-2025** from 13:00 to 16:00 hours. WAPCOS Contact person for Site visit is Mr. Nilesh Kumar (Mob. No. +91-7677024959). It is advised to send senior representative during site visit for actual assessment of the project site location
l)	Pre-Bid Meeting	:	**14-08-2025** at 12:00 noon to be held in the office of Chief Engineer, Construction Management Unit-III
m)	Last date & time for online submission of Technical & Financial Bid	:	**19-08-2025** up to 15:00 hours
n)	Offline Submission of Technical document, Tender Fees, EMD etc. as detail in Tender for bidders**.**	:	**19-08-2025** up to 17:00 hours in the office of Chief Engineer (CMU-III), WAPCOS, Construction Management Unit-III at 1st Floor, NPCC Building, Plot No. 148, Sector- 44 Gurugram- 122003, Haryana
o)	Online opening of Technical Bid	:	**20-08-2025** up to 16:00 hours
p)	Online opening of Financial Bid	:	It will be intimated to Technically Qualified Bidders.
q)	Tender Inviting Authority & Communication address during Tendering and Execution of Works	:	Chief Engineer (CMU-III), 1st Floor, NPCC Building, Plot No. 148, Sector – 44, Gurugram 122003 (Haryana) Ph: 0124-4488018 Email: projects@wapcos.co.in
r)	The Bid Security/ EMD / Solvency Certificate / BG against Performance Security shall be addressed to WAPCOS Corporate Office	:	**WAPCOS Limited** 76-C, Institution Area Sector-18, Gurugram, Haryana-122015
s)	Ceiling on maximum number of works / Packages to be awarded by WAPCOS to the Single bidder / Contractor		1. The works for Construction and Development of SSB Battalion Head Quarters are invited for 3 (three) locations. 2. Each bidder shall be entitled to award and execute only for 1 location at a time. 3. If any bidder submits the bids for more than 1 locations and found L-1 in more than 1 locations, the L-1 bidder will be awarded

			only 1 location of his choice and the balance locations shall be withdrawn from the L-1 bidder. In that case, L-2 bidder shall accept and execute the works, withdrawn from the L-1 bidder, on the rates and price quoted by the L-1 bidder. If the L-2 bidder does not accepts the L-1 rates, the tender shall be cancelled and re-tendered.
If the office of WAPCOS Limited, Gurugram happens to be closed on the last date and time mentioned for any of the event, the said event will take place on the next working day at the same time and venue.			

The tender document has to be viewed/ downloaded from above specified websites. Bidders are advised to visit above specified websites regularly for updates /Amendments/ Corrigendum, if any and not be published elsewhere. The Updates/Corrigendum/Addendum shall be followed up to submission of tender and it will be the part of tender.

The purpose of this NIT is to provide interested parties with information to assist the preparation of their bid. While WAPCOS Limited has taken due care in the preparation of the information contained herein, and believe it to be complete and accurate, neither it nor any of its authorities or agencies nor any of its respective officers, employees, agents or advisors give any warranty or make any representations, expressed or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it. The Bidders must read all the terms and conditions of bidding document carefully and only submit the bid if eligible and in possession of all the documents required.

Further, WAPCOS Limited does not claim that the information is exhaustive. Respondents to this NIT are required to make their own inquiries/ surveys and will be required to confirm, in writing, that they have done so and they did not rely solely on the information in NIT. WAPCOS Limited is not responsible if no due diligence is performed by the bidders.

If the office of WAPCOS Limited, New Delhi happens to be closed on the last date and time mentioned for any of the event, the said event will take place on the next working day at the same time and venue.

IMPORTANT POINTS

1.1 Bidder/ Contractor should be an Indian Registered Company under Companies Act 1956/ 2013, Proprietorship Firm/ Partnership Firm. **Joint Ventures are not accepted**

1.2 Principal Employer/ Owner/Client means of Sashastra Seema Bal, Ministry of Home Affairs, Gov.t of India herein referred as “SSB”.

1.3 Employer” shall mean “WAPCOS Limited”, A Government of India undertaking- Ministry of Jal Shakti, as Project Management Consultant appointed by the SSB.

1.4 All Bidders are hereby cautioned that Bids containing any deviation or reservation as described in Clauses of “Instructions to Bidders” shall be considered as non-responsive and shall be summarily rejected.

1.5 WAPCOS Ltd. reserves the right to accept or reject any or all bids without assigning any reasons. No Bidder shall have any cause of action or claim against the WAPCOS Ltd. For rejection of his Bid and will not be bound to accept the lowest or any other tender.

1.6 No reimbursement of cost of any type or on any account will be paid to persons or entities submitting their Bid.

1.7 All information submitted in response to this NIT shall be the property of WAPCOS Limited and it shall be free to use the concept of the same at its will.

1.8 It is hereby declared that WAPCOS is committed to follow the principle of transparency, equity and competitiveness in public procurement. The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected. This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the WAPCOS.

For and on behalf of WAPCOS LIMITED

-sd-
Chief Engineer
Construction Management Unit – III

SECTION– I

INSTRUCTIONS TO BIDDER

SECTION– I

INSTRUCTIONS TO BIDDER

1.0 SPECIAL INSTRUCTIONS TO BIDDERS FOR E-TENDERING

1.1 GENERAL

Submission of Online Bids is mandatory for this Tender. E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. For conducting electronic tendering, bidders shall use the portal www.etenders.gov.in/ eprocure. Tender is invited in Single Stage –Two Envelope system, one Technical Bid and second as financial bid. Accordingly, bidder is directed to make all formalities and registration on www.etenders.gov.in/eprocure website and submit the Technical Bid and Financial bid.

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: https://etenders.gov.in/eprocure/app**.**

1.2 REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://etenders.gov.in/eprocure/app) by clicking on the link “Online bidder Enrollment” on the CPP Portal which is free of charge.

2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.

5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC’s to others which may lead to misuse.

6) Bidder then logs in to the site through the secured log-in by entering their user ID /Password and the password of the DSC / e-Token.

1.3 SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced

search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.

2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e- mail in case there is any corrigendum issued to the tender document.

3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

1.4 PREPARATION OF BIDS

a) Bidder should take into account any corrigendum, Addendum published on the web portal along with tender document before submitting their bids.

b) Bidder should read the tender document, corrigendum, Addendum and any other related correspondence, carefully to understand the documents required to be submitted as part of the bid.

c) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.

1.5 SUBMISSION OF BIDS

1) Please uninstall any Java version if installed already. Then go to this link https://eprocure.gov.in/cppp/jre-windows-i586.exe and download this prescribed version of java for this portal

2) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

3) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

4) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

5) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.

6) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent,

should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.

7) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

8) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

9) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

10) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

11) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

12) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

1.6 INSTRUCTIONS TO BIDDER

The purpose of these instructions to serve as a guide to Bidders for preparing offer for carrying out the project in all respect.

a) Submission of a tender by a tenderer implies that the tenderer has read this notice and all other Tender Documents and has made himself aware of the scope, the specifications and conditions of contract, local conditions and other factors having bearings on the execution of the work.

b) WAPCOS Limited desires that the bidders, suppliers, and Sub-contractors under the

Project, observe the highest standard of ethics during the performance, procurement and execution of such contracts. In pursuance of this requirement, WAPCOS Limited, defines, for the purposes of this provision, the terms set forth below:

i. "Corrupt Practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

ii. "Fraudulent Practice" means any act of submission of forged documentation, or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation, or to succeed in a competitive bidding process;

iii. "Coercive Practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

iv. "Collusive Practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.

Will reject the award of Contract, even at a later stage, if it determines that the bidder recommended/ selected for award/awarded has, directly or through an agent, engaged in Corrupt, Fraudulent, Collusive, Or Coercive Practices incompeting for the Contract;

Will sanction a party or its successors, including declaring ineligible, either indefinitely or for a stated period of time, to participate in any further bidding/procurement proceedings under the Project, if it at any time determines that the party has, directly or through an agent, engaged in Corrupt, Fraudulent, Collusive, Or Coercive Practices in competing for, or in executing, the contract; and

The party may be required to sign an Integrity Pact, if required; and WAPCOS Limited will have the right to require the bidders, or its suppliers, contractors and consultants to permit WAPCOS Limited 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 WAPCOS Limited at the cost of the bidders.

The Bidder must obtain for himself on his own responsibility and at his own expenses all the information which may be necessary for the purpose of making a bid and for entering into a contract, must examine the Drawings, must inspect the sites of the work, acquaint himself with all local conditions, means of access to the work, nature of the work and all matters pertaining thereto. WAPCOS Limited will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

c) The Contract shall be governed by each SECTION OF TENDER DOCUMENT and all other Conditions mentioned in the tender documents.

d) All Bidders are hereby explicitly informed that conditional offers or offers with deviations from the Conditions of Contract, the bids not meeting the minimum eligibility criteria, Technical Bids not accompanied with EMD and Tender Document Fees of requisite amount in acceptable format, Bids in altered/modified formats, or in deviation with any other requirements stipulated in the tender documents are liable to be rejected.

e) The company reserves the right to waive minor deviations if they do not materially affect the capability of the Tenderer to perform the contract

f) The bidders shall not tamper or modify any part of the tender documents in any manner. In case in part of the bid is found to be tampered or modified at any stage, the bids are liable to be rejected, the contract is liable to be terminated and the full earnest deposit/retention money/performance guarantee will be forfeited and the bidder will be liable to be banned from doing any business with WAPCOS Limited.

g) Incomplete Price bid shall be liable to be rejected, at the discretion of WAPCOS Limited. The total bid price shall cover the entire scope of works covered in the tender.

1.7 BID OPENIGN AND EVALUATION

Bids shall be opened as per the schedule. The Bidder will be at liberty to be present either in person or through an authorized representative at the time of opening of the Bid. The Bids will be opened in the presence of Bidders' representative who wish to attend on the time, date and venue as mentioned in NIT. The physical Bid shall also be opened on the day of Tender opening

1.8 AWARD OF CONTRACT

The work shall be award the Contract to the L-1 Bidder whose Bid has been determined to be responsive and the lowest based on LCS System.

2.0 EARNEST MONEY DEPOSIT (EMD) / BID SECURITY

The Earnest Money Deposit shall be as per the details mentioned in NIT. EMD shall not carry any interest. The Bid Security/ EMD of the unsuccessful bidder shall be returned at the earliest after expiry of final bid validity period and latest by 30th days after the award of the contract. Bid Security shall be refunded to the successful bidder on receipt of Performance Security.

The successful bidder shall accept the Letter of Award (LOA) within 15 (Fifteen) days from receipt of the same, failing which the EMD shall be forfeited and the award of work may be liable to be cancelled.

If any bidder withdraws or make any changes in his offer already submitted before the expiry of the validity period or any extension thereof without the written consent of the company, the EMD amount will be forfeited for such act of the bidder.

WAPCOS Limited reserves the right of forfeiture of Earnest Money deposit (EMD) in case of the successful bidder.

i. After opening of Tender, revokes his tender within the validity period or increases his earlier quoted rates.
ii. Does not commence the work within the period as per LOA/Contract. In case the LOA/Contract is silent in this regard then within 15 days after award of contract.

The Bid Security will be forfeited in the bidder

i) withdraws or amends its/ his tender;
ii) impairs or derogates from the tender in any respect within the period of validity of the tender;
iii) If the bidder does not accept the correction of his bid price during evaluation; and
iv) If the successful bidder fails to sign the contract or furnish the required performance security within the specified period.

3.0 LANGUAGE OF BID

The Bid and all related correspondence and documents relating to the Project shall be in English language only. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate English translation which shall be certified by a qualified translator. Any material that is submitted in a language other than English and which is not accompanied by an accurate English translation will not be considered.

4.0 BIDDERS RESPONSIBILITY

The Bidder is solely responsible for the details of their Bid and the preparation of bids. In no case shall the WAPCOS be responsible for any part of the tender documents submitted by him. Any Site information given in this tender document is for guidance only. The Bidder is advised to visit and examine the Site of works and its surroundings at their cost and obtain for I on their own responsibility, all information that may be necessary for preparing the tender and entering into a Contract. Irrespective of whether or not the Bidders have attended the pre-bid meeting, they shall be deemed to have inspected the Site and its surroundings beforehand and taken into account all relevant factors pertaining to the Site and clarifications/ modifications/ additions given in Pre-Bid meeting or addendum issued in the preparation and submission of the Bid.

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. WAPCOS Limited shall in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

5.0 PERIOD OF COMPLETION

The completion period shall be as per NIT. The completion period is for the entire work of planning, execution, approvals, arrangement of materials, equipment, delivery at site including transportation, construction/ installation, testing, commissioning, NoCs & statutory approvals from local bodies and successfully handing over of the entire project to the satisfaction of the Principal Employer/ Employer.

6.0 AMENDMENT OF BID DOCUMENTS

At any time prior to the deadline for submission of bids, the Employer may, for any reason (s), whether at their own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by the issuance of a corrigendum/ addendum. No modification of Bid shall be permissible after last date of submission, whatever may be the reason. The Employer may at their discretion may extend the deadline for submission of Tender/ Bid, if considered necessary.

Any corrigendum/ addendum thus issued shall be part of the bidding documents. Prospective Bidders shall download the same from the e-portal and submit along with the submission of Bid as token of acceptance

7.0 BID VALIDITY PERIOD

Bids shall remain valid for acceptance for a period of 90 days (Ninety days) from the date of opening of financial Bids.

In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request the Bidder for a specified extension in the period of validity. The request and the responses thereto shall be made in writing or by e-mail. A Bidder may refuse the request. A Bidder agreeing to the request will not be required/nor permitted to modify his bid.

8.0 CURRENCY OF BID

Bid prices shall be quoted in Indian Rupees.

For & on behalf of Tenderer

SECTION– II

SELECTION AND QUALIFYING CRITERIA

SECTION-II

SELECTION AND QUALIFYING CRITERIA

1.0 PROJECT

Sashastra Seeme Bal (SSB), Ministyy of Home Affairs, Govt. of India has identified around 42.56 acres of land to Develop and Construct the Infrastructure facilities at the Battallion Head Quarter at Araria, Bihar. The approximate plinth area of the Infrastructure facilities to be developed will be 11662 Sqm.

The project shall include construction of Admin Block / Training Block and Offices, Barrack, Residential Quarters, Electrical Sub-station, Water Tank including Civil, Electrical, MEP works including External development, internal roads including footpaths, Water Supply Distribution Network, Storm Water Drainage Network, Rain Water Harvesting Structures, Underground water tanks (UGT) for fire and domestic drinking water, Boundary walls, Horticulture & Landscaping works, Sewage Treatment Plant, Fire-fighting system, Sub-stations etc.

In order to develop the SSB Battalion Head Quarter at Araria, Bihar, WAPCOS intends to engage an EPC Contractor for **Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I.**

2.0 SITE VISIT

Intending Bidder(s) are advised to inspect and examine the site at his own cost and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid in order to avoid impractical and non-serious bids. A bidder(s) shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder(s) shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder(s) implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

3.0 PRE-BID MEETING

Prospective Bidder requiring any clarification of the bidding documents may notify the Employer via email mentioned in NIT, at least one working day prior to pre-bid meeting. The queries shall be discussed during the pre-bid meeting and the last date for submission of any further queries of Bidders shall be within two days from the date pre-bid meeting. Thereafter no further queries/clarifications shall be entertained. The Employer will reply to only those queries which received before the scheduled time as mentioned above via e-portal which are essentially required for submission of bids. The Employer will not reply to

the queries which are not considered fit like replies of which can be implied /found in the NIT/Tender Documents or which are not relevant or in contravention to NIT/Tender Documents.

The intending bidders should depute their authorized person with authorization letter in original to attend the pre-bid meeting. The pre-bid meeting shall be held at the communication address mentioned in NIT. The Addendum/ Corrigendum/Replies to pre bid queries as per Pre bid meeting, shall be uploaded on e-portal & WAPCOS website.

4.0 QUALIFYING CRITERIA: ONLINE TECHNICAL BID SUBMISSION

The intending bidders must read the terms & conditions of tender documents carefully. He should only submit bid if he considers himself eligible and he is in possession of all the documents required.

The Technical Bid shall be uploaded **with coloured scanned copies of following documents. All the documents must be Serial wise as stated below along with check list and clearly marked page no. on each page**

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
a)	Authority to Sign the tender: a) In case of proprietary firm, the Proprietor shall sign with full name, current address OR by the authorized person holding Notarized Power of Attorney issued by the Proprietor for signing of this bid. b) In case of a Limited Company, Partnership firm or Corporation, the Application shall be signed by an authorized person holding the Power of Attorney. A certified copy of the Power of Attorney shall accompany the Application. **Note:** Power of Attorney duly notarized and on a stamp paper of appropriate value, issued and signed by the member, authorizing the person for signing the tender documents, make corrections/ modifications, to interact with the Employer and act as the contact person, shall be submitted along with Technical Bid. The Power of Attorney shall be submitted in original and shall be specific to the Bid submission only.			
b)	Scanned copy of EMD Documents **Note:** The EMD documents will be verified from the issuing bank by WAPCOS prior to opening of Financial Bid			
c)	Scanned copy of Demand Draft for Tender Fees			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
d)	Letter of Transmittal For Technical Bid and Financial bid along with Declaration by the Bidder on bidder's original letter Head as per given format			
e)	Yearly sales Turnover and Audited Balance Sheet for Last 5 (five) years ending on the financial year 2023-24. The requisite certificates (**Form-A**) must be certified by Statutory Auditor of the firm/company which must carry UDIN (Unique Document Identification Number) which will be verified from ICAI Portal.			
	• **Profit / loss (after Tax)**: The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during last five years ending 2023-24.			
	• **Turnover:** Average annual financial turnover of bidder should be at least Rs. 25.11 Crores during the immediate last 3 consecutive financial years ending 2023-24.			
	• Full Balance Sheet and Profit & loss Statement of Bidder, duly audited by Independent Chartered Accountant.			
	• The net worth of the bidder should be positive during the last financial year i.e.2023-24. **Note:** There is no need to upload entire voluminous balance sheet. However, summarized balance sheet (Audited) and summarized Profit & Loss Account (Audited) for last 05 years shall be uploaded.			
f)	**Solvency / Banker's Certificate** The bidder contractor should not be insolvent, in receivership, bankrupt or being wound up, not have had their business activities suspended. Bank Solvency Certificate issued from a Nationalized / Scheduled Commercial Bank approved by Reserve Bank of India (RBI) should be at least 40% of the estimated cost of the work. The Certificate should be issued between the publishing of NIT & last date of submission of Bids, including extensions if any and shall be addressed to WAPCOS Limited, 76-C, Institutional Area, Sector-18, Gurugram, Haryana specific to this Bid submission only and mentioning the name of the work/project. The certificate shall be submitted in original and the			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
	colour / b&w copy / scanned copy shall not be accepted. The certificate should carry name, designation of the bank official, who has the authority to issue Solvency Certificate Note: This Certificate will be verified from the issuing authority by WAPCOS			
g)	**Completed Similar Work Criteria:** The bidder should have satisfactorily completed the similar types of works as mentioned below during the last seven years ending previous day of last date of submission of tender.			
(i)	i) One similar completed work costing not less than 80% of the estimated cost of work. Or ii) Two similar completed works of order value each not less than 50% of the estimated cost of work. Or iii) Three similar completed works of order value not less than 40% of the estimated cost of work. **Note:** **Similar work** shall means any completed RCC framed buildings including Mechanical/ Electrical/ Plumbing/ Fire fighting / External Developemnt Works during last seven years. The bidder shall submit Completion Certificate(s) for the same along-with LOI(s)/W.O(s) from respective Owner(s)/Client(s). The copy of completion certificates shall be got verified from the issuing authority/organizations prior to award of works. The value of the work done declared is to be without GST / Taxes. For the works, where the Taxes or GST is not clearly defined, the value of works shall be considered as including GST and GST @12% shall be deducted for the works completed up to 31.12.2021 and GST @18% shall be deducted for the works completed after 01.01.2022 to establish the value of work done. The value of executed works shall be brought to the current level by enhancing the actual value of work done at a simple rate of 7% per annum,			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
	calculated from the date of completion of last day of the month previous to the one in which applications are invited. The past experience in similar nature of work and also for additional experience should be supported by certificates issued by the Client's organization. In case, the works / certificates are not verified by the issuing authority, WAPCOS reserves the right to not consider for the award of works. For work experience of private sector, the completion certificates shall be supported with copies of corresponding TDS certificates. In case of mismatch in value in TDS certificate & completion certificate, then value mentioned in TDS certificate will be considered during evaluation. Note: The completion / experience certificates, along with the supporting documents, shall be got verified from the issuing authority / organizations prior to opening of Financial Bid			
h)	**Verification of EMD/ Solvency/ Banker's Certificate/ Completion Certificates.** Verification should be done from the official email id of issuing Authorities. The bidder will provide official e-mail, Landline number of the Issuing Authorities in prescribed Form-C with undertaking. Bidder will ensure the email ids and landline are in working condition. If Bank Guarantee/ Solvency / Banker's Certificate/ completion certificate is not verified by the issuing authority, then it will not be considered for technical evaluation.			
i)	**Bid Capacity** as prescribed in **Form-D**. The bidder should possess the bidding capacity as calculated by the specified formula. The formula generally used is: **Available bid capacity = A x 1.5 x N – B, where** A = Maximum value of engineering (Civil/ Electrical/ Mechanical as relevant to work being procured) works executed in any one year during the last five years (updated at the current price level), taking into account the completed as well as works in progress.			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
	N = Number of years prescribed for completion of the work in question. B = Value (updated at the current price level) of the existing commitments and ongoing works to be completed in the next 'N' years. **NOTE:** The bid capacity shall be positive. Otherwise the bid shall be rejected. The bidder shall furnish statements showing the value of existing commitments and on-going works as well as stipulated period of completion remaining for each of the works separately. The value of executed works shall be brought to the current level by enhancing the actual value of work done at a simple rate of 7% per annum, calculated from the date of completion of last day of the month previous to the one in which applications are invited.			
j)	**EPF Registration:** The agency should have EPF registration.			
k)	**GST Registration & PAN:** Bidder shall submit valid GST registration certificate for the state where work is to be executed and PAN Card. If not registered till date of submission of bid, bidder will give undertaking on bidder letter head stating that they will get registered in GST as per Govt. norms before submitting of 1st bill of executed works.			
l)	**Indian Registered Company:** The bidder should be an Indian Registered Company under Companies Act 1956/ Proprietorship Firm/ Partnership Firm. Copy of Certificate of Incorporation/ Registration/ Partnership Deed Registration or any other relevant document, as applicable, should be submitted along with a copy of address proof. **NOTE:** Proprietor firms shall submit registration details or shall submit the copy of relevant page of			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
	Pass book for the Current Account in the name of Proprietor Firm.			
m)	**Structure & Organization:** The bidder will submit Name, address, details of the organization, Name(s) of the Owner/partners/promoters and Directors of the firm/ company as prescribed in **Form-E**.			
n)	**Undertaking for Manpower Deployment:** The bidder will submit "**Undertaking for Manpower Deployment"** as prescribed in **Form –F**			
o)	**Non – Conviction Certificate:** The bidder will submit the undertaking regarding **"Non –Conviction Certificate"** as prescribed in **Form-G.**			
p)	**No Deviation Certificate:** The bidder will submit **'No Deviation Certificate'** as prescribed in **Form-H.**			
q)	**Undertaking regarding Blacklisting / Non Debarment** The bidder will submit the "Undertaking regarding Blacklisting / Non Debarment" as prescribed in **Form-I.**			
r)	**Undertaking regarding Restriction under Rule 144(XI) of the General Finance Rules (GFRs) 2017** The bidder will submit the "Undertaking regarding Restriction under Rule 144(XI) of the General Finance Rules (GFRs) 2017" as prescribed in **Form –J**.			
s)	**Preference to Make in India:** The bidder shall submit undertaking indicating percentage of local content used during the execution of work as per the order of Public Procurement (Preference to Make in India) as prescribed in **Form-K1 OR Form-K2**			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
t)	**Letter for Integrity and Integrity Agreement** The bidder will submit Consent Letter along with Integrity Agreement on appropriate value of Stamp Paper to execute the Integrity Pact as prescribed in **Form-L**			

No information relating to financial terms of services should be included in the technical bid. Bids are to be submitted to determine that the bidder has a full comprehension of the tendered work. Where a bidder technical submittal is found non – compliant with the requirement or work, it may be rejected. This process is to assure that only technical acceptable bids are considered for the tendered work.

5.0 OFFLINE SUBMISSIONS OF DOCUMENTS

The Bidder shall submit following Document offline also.

1. **All the documents in ORIGINAL, mentioned in "Section-II: Selection and Qualifying Criteria" in Para 4: Qualifying Criteria: Online Technical Bid Submission i.e. at Sr. No. (a) to (t) along with checklist & page numbering *(MANDATORY)*** in separate sealed envelope clearly labeled as "TECHNICAL BID" for the Work (Write Name of Work/Project as mentioned in NIT) along with Details of Bidders Address, Phone, E-mail on Envelope.

2. **Original Tender submission fee & EMD** in separate sealed envelope clearly labeled as "TENDER FEE & EMD" for the work (Write Name of Work/Project as mentioned in NIT) along with Details of Bidders Address, Phone, E-mail on Envelope.

NOTE: All above two envelopes shall be submitted in one single envelope clearly labeled as "Documents for Offline Submission" for the Work (Write Name of Work/Project as mentioned in NIT) along with Details of Bidders Address, Phone, E-mail on Envelope.

IMPORTANT NOTE:- The offline submissions as mentioned above shall be submitted on WAPCOS address mentioned in NIT as per date & time mentioned in NIT otherwise the bids will be rejected**.** The bids shall be summarily rejected in case of non submission of offline documents

6.0 CONTENTS OF FINANCIAL BID

The Financial Bid should be uploaded online before last date & time of submission of Tender Document.

Quoted amount by the Bidder shall be firm during the performance of the Contract. Quoted amount by the Bidder with any condition shall not be accepted and same is liable to be rejected

Quoted amount by the Bidder shall include all Materials, Tools & Plant, labour, supervision, profit; other levies together with all general risks, liabilities and obligations set out or implied in the contract, applicable Labour Cess, cost of insurance to this contract, all applicable tax liabilities like Income Tax & Surcharges, etc. Any other taxes /cess as per Government

directives shall be deducted from each bill paid to the Contractor, from time to time. GST shall be payable extra as per prevailing rates.

The Contractor shall submit e-invoice / Tax Invoice (as applicable for the bidder's Firms) to WAPCOS showing (i) Basic amount (ii) GST amount separately in each bill. It is mandatory to bidders to deposit GST within time limit framed by Govt. of India, if applicable. The Goods and Services Tax (GST), shall be reimbursed to the Agency only after uploading of bills by Contractor on GST Portal "to avail Input benefit of GST".

The WAPCOS shall be performing all its duties of deduction of TDS and other deduction on payment made to the contractor as per applicable legislation in force on the date of submission of bid or to be newly/amended introduced during the execution of the Contract.

7.0 OPENING OF FINANCIAL BID

The financial bids of the technically qualified bidders shall be opened at the notified date & time. Final selection of the bidder will be made based on the least cost method.

8.0 SIGNING OF THE CONTRACT

The letter of Award will be issued to the successful bidder by WAPCOS which will be duly signed & stamped by the successful bidder as token of unequivocal acceptance and confirmation within 5 working days. Subsequently, successful bidder shall submit the Performance Security of required value within the specified time period. Thereafter, on a date and time mutually agreed upon, the successful Bidder or his authorized representative shall attend the office for signing of the Contract Agreement.

Failure on the part of the successful Bidder to comply with the above requirements will constitute sufficient grounds for the annulment of the Award and forfeiture of the Bid Security.

SECTION – III

FORMS

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

LETTER OF TRANSMITTAL FOR TECHNICAL BID

To,
The Chief Engineer
Construction Management Unit-III
WAPCOS Limited

Subject: Submission of Bids for …….(Name of Work/ Project)
Sir,

Having examined the details given in tender document for the above work, I/we hereby submit the relevant information.

i. I / We acknowledge that the WAPCOS will be relying on the information provided in the Bid and the documents accompanying the Bid & detailed provided in the enclosed "Forms" for selection of the Contractor for the aforesaid Project, and we certify that all information provided in the Bid are true and correct; nothing has been omitted which renders such information misleading; and all documents accompanying the Bid are true copies of their respective originals.
ii. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
iii. I/we submit the requisite Certificate for solvency, Completion Certificates, Financial Information's and authorize WAPCOS Ltd. to approach the Issuing Authority to confirm the correctness thereof. I/we also authorize WAPCOS Ltd. to approach individuals, employers, firms and corporation to verify our competence and general reputation.
iv. I/ We acknowledge the right of the Authority to reject our Bid without assigning any reason or otherwise and hereby waive, to the fullest extent permitted by applicable law, our right to challenge the same on any account whatsoever.
v. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works:

Name of work	**Certificate from**

Date:

Place:

(Signature, Name, Designation of the Authorized signatory with Seal)

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

DECLARATION BY THE BIDDER

This is to certify that We, M/s ……., in submission of this offer confirm that:-

We have inspected the site of work and have made myself/ourselves fully acquainted with local conditions in and around the site of work. We have carefully gone through each & every section of the tender document for the work "**…… … .... …….** (Name of work)".

1. Our tender is offered taking due consideration of all factors mentioned in tender documents.
2. We promise to abide by all the stipulations of the Contract documents and carry out and complete the work to the satisfaction of the Employer/ Principal Employer.
3. We also agree to procure Plants and Machineries at our cost required for the work. We also submit that we have Organizational Structure comprising adequate Technical Personnel in the line of requirement. We also agree to accomplish the job entrusted to us in the stipulated time laid out in document except situations not under our control.
4. We have not made any misleading or false representation in the forms, statement and attachments in proof of the qualification requirements;
5. We do not have records of poor performance such as abandoning the work, not properly completing the Contract, inordinate delays in completion or financial failures etc.
6. We have submitted all the supporting documents and furnished the relevant details as per prescribed format.
7. We are financially sound and have not applied or be under corporate debt restructuring.
8. List of Similar Works satisfying Qualification Criterion as indicated hereinafter, does not include any work which has been carried out by us through a Subcontractor on a back-to-back basis.
9. The Cost has been quoted by me/us for bid after taking into consideration all the terms and conditions stated in the Tender Document, our own estimates of costs and after a careful assessment of the site and all own the conditions that may affect the project cost and implementation of the project.
10. I / We shall keep this offer valid as period specified in the NIT.
11. I / We hereby submit our FINANCIAL BID and Offer Cost for undertaking the aforesaid Project in accordance with the Bidding Documents and the Agreement.
12. In the event of my/ our being declared as the Selected Bidder, I/we agree to enter into a Agreement in accordance with the format of Contract Agreement. We agree not to seek any changes in the aforesaid format of Contract Agreement and agree to abide by the same.

Certificate:

It is certified that the information given in the enclosed bid are correct. It is also certified that I/we shall be liable to be debarred, disqualified / cancellation of enlistment in case any information furnished by me/us found to be incorrect.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM-A: FINANCIAL INFORMATION

[TO BE SUBMITTED ON ORIGINAL LETTER HEAD OF STATUTORY AUDITOR OF BIDDER]

Years	Gross Annual turnover	Profit/Loss (After Tax)	Net worth
2019-2020			
2020-2021			
2021-2022			
2022-2023			
2023-2024			

Above Details are being furnished as per the figures in balance sheet for the last five years in respect of M/s ……..(Name & address of firm of bidder), as submitted by the firm to the Income Tax Department.

Date: **(Signature of Statutory Auditor with Seal)**

UDIN No. :

Place:

FORM- B: SOLVENCY / BANKER'S CERTIFICATE

[TO BE SUBMITTED ON ORIGINAL LETTER HEAD OF ISSUING BANK]

To
WAPCOS Limited,
76-C, Institutional Area,
Sector-18, Gurugram, Haryana

This is certify that to the best of our knowledge and information that M/s ……..…… having marginally noted address,…… …… …….. as a Customer of our Bank Account are/ is respectable and can be treated as good for any engagement up to a Limit of Rs. …… (Rupees……)
This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature for The Bank)

NOTE:

1. Banker's certificates/ Solvency Certificate should be on letter head of the Bank addressed to WAPCOS Limited, 76-C, Institutional Area, Sector-18, Gurugram, Haryana.
2. In case of partnership firm, certificate should include name of all partners as recorded with the Bank.
3. Bank may do the minor changes in the format as per the approved format of bank without changing the gist of content.

FORM-C: CORRESPONDENCE DETAILS OF ISSUING AUTHORITY

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Bank Guarantee/ Solvency / Banker's Certificate/ Completion Certificate

Name of Work: ……

1. EMD submitted in form of Bank Guarantee/ FDR

Present address of the Issuing Branch	Official Email Id	Landline no	Other Contact no.

2. Solvency Certificate / Banker's Certificate

Present address of the Issuing Branch	Official Email Id	Landline no	Other Contact no.

3. Completion Certificate

Present address of the Issuing Authority	Official Email Id	Landline no	Other Contact no.

This is to certify that above information is correct and is gathered from the Issuing Authorities by us for the verification of concerned documents. We understand that if the documents is not verified by the issuing authority within 5 working days, then our bid is liable to be rejected.

Date:

Place:

(Signature, Name, Designation of the Authorized signatory with Seal)

FORM- D: BID CAPACITY

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

Available bid capacity = A x 1.5 x N – B

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

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

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

Existing Commitments & on-going works details:

Description of work	Location	Contract no.	Name of address of Client	Value of Contract (Rs. Cr.)	Stipulated period of completion	Value of remaining work (Rs. cr.)	Anticipated date of completion

NOTE:

The bidder shall furnish statements showing the value of existing commitments and on-going works as well as stipulated period of completion remaining for each of the works separately.

The value of executed works shall be brought to the current level by enhancing the actual value of work done at a simple rate of 7% per annum, calculated from the date of completion of last day of the month previous to the one in which applications are invited.

FORM- E: STRUCTURE & ORGANISATION

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

S.No.	Particulars	Details
1.	Name & Registered Address of the Bidder	
2.	Address and Email on which Correspondence will be made during Tendering & after Award of Work	
3.	Telephone no./Telex no./Fax no.	
4.	Legal status of the Bidder (attach copies of original document defining the legal status) (a) A Proprietary Firm (b) A Partnership Firm I A Limited Company or Corporation (d)A Company registered under company's Act 1956/2013	
5.	Particulars of Registration with various Government Bodies (Attach attested photocopy) **Organization/Place of Registration** 1. 2. 3.	**Registration No**. 1. 2. 3.
6.	Names and Titles of Directors with designation as per Legal Status of Company	
7.	Designation of Senior Level Officers authorized to act for this work	
8.	Any other information considered necessary but not included above.	

Date:

Place:

(Signature, Name, Designation of the Authorized signatory with Seal)

FORM- F: - UNDERTAKING FOR MANPOWER DEPLOYMENT

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

This is to certify that We, M/s ……., in submission of this offer confirm that:-

Our tender is offered taking due consideration of all factors including site requirements information and conditions stated in the detailed Instructions to Bidders to execute the work up to the standards as laid out in Employer's Requirements and other sections of Tender Document.

We agree to employ the number of technical staff during the execution of this work as defined in the tender document. We shall deploy additional manpower as deemed fit and required to complete the project within stipulated completion period, without any additional cost to the Employer.

WAPCOS shall have full power and without giving any reason to us, immediately to get removed any representative, staff and workmen or employees on account of misconduct negligence or incompetence or whose continued employment may in his opinion be undesirable. We shall not claim any compensation on this account.

In case we fail to deploy the technical staff as mentioned in the tender document, we shall be liable to pay a sum of Rs. 50,000/- (Rupees fifty Thousand only) for each month of default in the case of each Graduate Engineer and Rs. 40,000/- (Rupees Forty Thousand only) in the case of each Diploma Engineer and details will be submitted with each Bill. We shall not raise any objection if deduction is made for the same from Running Bills.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM-G: NO-CONVICTION CERTIFICATE

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

This is to certify that _____ (Name of the organization), having registered office at _____ (Address of the registered office) has never been convicted by any Central / State Government Department or Court of law anywhere in the country.

This is also to certify that we are not involved in any form of Corrupt and Fraudulent Practices in past and will never be involved in future.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM-H: NO DEVIATION CERTIFICATE

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

This is to confirm that as per Tender conditions we have visited site before submission of our Offer and noted the job content and site condition etc. We also confirm that we have not changed/modified the above tender document and in case of observance of the same at any stage it shall be treated as null and void.

We hereby also confirm that we have not taken any deviation from Tender Clause together with other reference as enumerated in the above referred Notice Inviting Tender and we hereby convey our unconditional acceptance to all terms & conditions as stipulated in the Tender Document.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null and void.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM-I: UNDERTAKING REGARDING BLACKLISTING / NON DEBARMENT

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

This is to certify that we have taken the cognizance of Blacklisting Policy of WAPCOS Ltd. Further, we hereby Confirm and declare that we, M/s_____ , is not blacklisted/De-registered/debarred by any Government Department/Public Sector Undertaking /Private Sector/ or any other agency for which we have Executed / Undertaken the works/ Services during the last 3 Years.

Date:

Place:

(Signature, Name, Designation of the Authorized signatory with Seal)

FORM-J: UNDERTAKING FOR RULE 144 (XI) IN THE GENERAL FINANCIAL RULES-2017

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

I / we ……(Name of the Firm) well aware about the Restrictions under RULE 144 (XI) In General Financial Rules (GFR), 2017 on procurement from country which shares a land border with India.. I/ we hereby certify that we are eligible to participate in the tender as per Rule 144 (xi) In The General Financial Rules (GFR), 2017

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM-K1: UNDERTAKING REGARDING PERCENTAGE OF LOCAL CONTENT

(TO BE SUBMITTED ON BIDDER ORIGINAL LETTER HEAD)

Name of Work: ……

We…… (Name of Firm) hereby confirm that we will follow the Make in India Policy and its Guidelines at the time of execution of subjected work. We have understood the provisions of Public Procurement (Preference to make in India) Local content Policy and will achieve the minimum local content target of 50%.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

OR

[**TO BE SUBMITTED ON ORIGINAL LETTER HEAD OF STATUTORY AUDITOR OF BIDDER]**

FORM-K2: UNDERTAKING REGARDING PERCENTAGE OF LOCAL CONTENT

We, …… , a Chartered Accountant firm having our registered office address…… hereby state that, we are Statutory Auditor of the Company M/s…… (CIN : ……..).

The Bidder is bidding for the "..…… (Name of work)

We have understood the provisions of Public Procurement (Preference to make in India) Local content Policy against WAPCOS Tender NIT No. …… Date -……..

We on the basis of the bidder's representation received, hereby confirm that, offer is achieving the minimum local content target as per of above Policy shall be **50%.**

Date: **(Signature of Statutory Auditor with Seal)**
UDIN No. :

Place:

Note: The format K1 will be required from bidder if the estimated cost of work is up to Rs. 10.0 Crore (excluding GST) and form k2 will be used for estimated cost of work is in excess of Rs. 10.0 Crore (excluding GST)

[TO BE SUBMITTED ON BIDDER'S ORIGINAL LETTER HEAD]

FORM-L: LETTER FOR INTEGRITY AND INTEGRITY AGREEMENT

To,
WAPCOS Limited,
76-C, Sector 18,
Institutional Area
Gurgaon, Haryana-122015

Sub: Integrity Pact for ------ (Name of Work / Project)

Dear Sir,

I/We acknowledge that WAPCOS is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document at **Appendix-I.**

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We am/are signing the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by WAPCOS. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, WAPCOS shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid is accordance with terms and conditions of the tender/bid.

Date: **(Signature, Name, Designation of the Authorized signatory with Seal)**

Place:

FORM L
INTEGRITY AGREEMENT

[Will be submitted on non-judicial Stamp paper of Rs.100 duly attested by notary/Magistrate]

This Integrity Agreement is made at ..... on this ..... day of ..... 20.....

BETWEEN

WAPCOS Limited, New Delhi (Hereinafter referred as the **'**EMPLOYER'**,** which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

..... (Name and Address of the Individual/firm/Company) through ..... (Hereinafter referred to as the (Details of duly authorized signatory)

"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

PREAMBLE

'The Employer' intends to award, under laid down organizational procedures, contract/ s for _____, 'The Employer' values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s) and/ or Contractor(s).

In order to achieve these goals, the Employer shall appoint Independent External Monitors (IEMs) who shall monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the 'The Employer'

1) 'The Employer' commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
   (a) No employee of the Employer, personally or through family members, shall in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
   (b) The Employer shall, during the tender process, treat all Bidder(s) with equity and reason. The Employer shall in particular, before and during the tender process, provide to all Bidder(s) the same information and shall not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
   (c) The Employer shall exclude from the process all known prejudiced persons.

2) If the Employer obtains information on the conduct of any of its employees, which is a criminal offence under the IPC/ PC Act, or if there be a substantive suspicion in this regard, the Employer shall inform the Chief Vigilance Officer and, in addition, can initiate disciplinary actions.

Section 2 – Commitments of the 'Bidder/ Contractor'

3) The 'Bidder/ Contractor' commit themselves to take all measures necessary to prevent corruption. The 'Bidder/ Contractor' commit themselves to observe the following principles during participation in the tender process and during the contract execution.

a) The 'Bidder/ Contractor' shall not, directly or through any other person or firm, offer, promise, or give to any of the Employer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
b) The 'Bidder/ Contractor' shall not enter with other Bidders info any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce 311tilize311311on311n in the tender process.
c) The 'Bidder/ Contractor' shall not commit any offence under the relevant IPC/ PC Act; further, the 'Bidder/ Contractor' shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Employer as part of the business relationship, regarding plans, technical proposals, and business details, including information contained or transmitted electronically.
d) The 'Bidder/ Contractor' of foreign origin shall disclose the name and address of the Agents/ representatives in India if any. Similarly, the Bidder/ Contractors of Indian Nationality shall furnish the name and address of the foreign Employers, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder/ Contractor. Further, as mentioned in the Guidelines, all the payments made to the Indian agent/ representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" is placed in Appendix to this agreement.
e) The 'Bidder/ Contractor' shall, when presenting their bid, disclose any and all payments made, is committed to, or intends to make to agents, brokers, or any other intermediaries in connection with the award of the contract.
f) Bidder/ Contractor who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.

4) The 'Bidder/ Contractor' shall not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the 'Bidder/ Contractor', before award or during execution, has committed a transgression through a violation of Section 2, above or in any other form such as to put their reliability or credibility in question, the Employer is entitled to disqualify the 'Bidder/ Contractor' from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings".

Section 4 – Compensation for Damages

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

Section 5 – Previous transgression

1) Bidder declares that no previous transgressions occurred in the last three years with any other Company in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify his exclusion from the tender process.

2) If Bidder makes an incorrect statement on this subject, he can be disqualified from the tender process, or action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6 – Equal treatment of all Bidders/ Contractors/ Subcontractors

7) In the case of Sub-contracting, the Principal Contractor shall take responsibility for the adoption of the Integrity Pact by the Sub-contractor.
8) The Employer shall enter into agreements with identical conditions as this one with all Bidders and Contractors.
9) The Employer shall disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal charges against violating Bidder(s)/ Contractor(s)/ Subcontractor(s)

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

Section 8 – Independent External Monitor

10) The Employer appoints a competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively whether and to what extent the parties comply with the obligations under this agreement.
11) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. The Monitor would have access to all Contract documents whenever required. It shall be obligatory for him/ her to treat the information and documents of the Bidders/ Contractors as confidential. He/ she reports to the Head of the Organisation.
12) The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Employer, including that provided by the contractor. The Contractor shall also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to Sub-contractors.
13) The Monitor is under contractual obligation to treat the information and documents of the Bidder/ Contractor(s)/ Sub-contractor(s) with confidentiality. The Monitor has also signed declarations on 'Non-Disclosure of Confidential Information and of 'Absence of Conflict of Interest'. In case of any conflict of interest arising at a later date, the IEM shall inform the Head of the Organisation and recuse himself/ herself from that case.
14) The Employer shall provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Employer and the contractor. The parties offer the Monitor the option to participate in such meetings.
15) As soon as the Monitor notices, or believes to have noticed, a violation of this agreement, he shall so inform the Management of the Employer and request the Management to discontinue or take corrective action or to take other relevant action. The monitor can, in this regard, submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action, or tolerate action.
16) The Monitor shall submit a written report to the Head of the Organisation within 8 to 10 weeks from the date of reference or intimation to him by the Employer and, should the occasion arise, submit proposals for correcting problematic situations.

17) If the Monitor has reported to the Head of the Organisation, a substantiated suspicion of an offence under relevant IPC/ PC Act, and Head of the Organisation has not, within the reasonable time, taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.
18) The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the contractor 12 months after the last payment under the contract and for all other Bidders 6 months after the contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

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

Section 10 – Other provisions

19) This agreement is subject to Indian Law. The place of performance and jurisdiction is the Registered Office of the Employer, i.e., New Delhi.
20) Changes and supplements, as well as termination notices, need to be made in writing. Side agreements have not been made.
21) If the contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
22) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties shall strive to come to an agreement with their original intentions.
23) Issues like Warranty/ Guarantee etc. shall be outside the purview of IEMs.
24) In the event of any contradiction between the Integrity Pact and its Appendix, the Clause in the Integrity Pact shall prevail.
25) For and on behalf of the Employer

SIGNED, SEALED AND DELIVERED

For and on behalf of the WAPCOS	**For and on behalf of the Contractor**
NAME _____	NAME _____
DESIGNATION	DESIGNATION
In the presence of witness:	**In the presence of Witness**
_1_____	_1_____
2 _____	2 _____

SECTION – IV

GENERAL CONDITIONS OF CONTRACT

SECTION – III

GENERAL CONDITIONS TO CONTRACT

1.0 GENERAL RULES AND DIRECTIONS

General Rules & Directions	1.	All works proposed for execution by contract will be notified in the form of invitation to tender posted on website. This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit and Performance guarantee to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs, drawings and any other document applicable to the work shall be open for inspection by the contractor in the office of officer inviting tender during office hours. The work involves execution as per name of work under either EPC Mode I or Mode II or Mode III as specified in Special Conditions of Contract ***Mode I*** involves Engineering (preparation of Architectural, structural and services design and drawings), procurement & construction by the contractor based on conceptual architectural drawings attached with the tender documents; ***Mode II*** involves part Engineering (preparation of structural and services design and drawings), procurement & construction by the contractor based on Preliminary/ Conceptual Architectural design and drawings attached with the tender documents; detailed Architectural design and drawings may be provided by the Engineer-in-Charge in stages/ parts during execution. ***Mode III*** involves procurement & construction by the contractor based on Architectural, structural and services design and drawings attached with the tender documents or to be provided by the Engineer-in-Charge in stages / parts during execution. The Type of building i.e Permanent or Semi-Permanent, based on the expected economic life of the building, shall be as specified in SCC. Tenders invited in Mode I and Mode II are technology neutral. Bidders can choose any of the approved technologies depending upon type of building, other suitability conditions (such as seismic zone, number of storeys etc.) as per Special Conditions of Contract under Mode I and II as per structural design, subject further to the condition that the structural system technologies categorized under Pre-cast Construction System and adopted for buildings under Seismic Zone IV as per IS 1893(Part-I) :2016 amended from time to time, shall have

		passed the full scale type testing for pseudo-static reversed cyclic test as detailed below: **Pseudo-Static Reversed –Cyclic Test** The test shall be conducted on typical three storeys of multi-storey building, which (a) are built with the full-scale components precast as per technology (b) are the weakest and/or most flexible, and (c) have all the typical connections of the building in precast, namely interior, exterior and corner wall to wall (vertical) connections, wall to slab (horizontal) connections and wall to wall (horizontal) connections, if any, as built in the original system with minimum four room layout plan. The bottom of the first storey shall be connected to the strong floor of the test facility, and the floors of the upper storeys to the Displacement-controlled actuators of the requisite Displacement (and force) capacity. This proto-type shall be loaded with the due vertical gravity load representing service level dead and live loads. The profile of displacement loading shall be as per the force distribution profile specified in IS 1893 (part I):2016 in the Equivalent Static Method of design. **Displacement controlled loading:** At least 3 loading cycles (Full positive and Full negative) at Each of the displacement excursions of 0.1%, 0.2%, 0.3%,0.4%, 0.5%, 0.75%, 1%, 1.5%, 2%, 2.5%, 3%, 3.5%, 4%, 5% and 6% drift of specimen, or failure of the specimen, whichever is earlier. (i) 6% drift requirement is an upper limit. Actual drift is expected to be lesser than 6% depending on: a) Deformability of the building, and Flexibility of the connections. The test may be stopped when either 6% drift or the maximum lateral force of 3 times the design base shear is reached. (ii) Pseudo-static reversed cyclic test does not require a Shake Table facility. **Number of samples and Frequency:** One sample shall be tested unless the structure shows premature failure before reaching at least 6% overall drift, either elastically or in elastically. If the structure fails to meet 6% drift requirement, then another sample be tested to reconfirm the failure pattern observed in the first specimen. If both samples fail, said configuration of the technology shall not be adopted in the work. One test for every new type of connection system adopted shall be conducted. If the connection type / combination of elements under approved technology are changed, either in part or in full, the system will be treated as new.

		The test should have been already got conducted from any government academic institute of repute or government R&D organization in India. The testing charges shall be borne by the contractor.
	2.	In the event of tender being submitted by a firm/company, it must be signed separately by each partner/director thereof or in the event of the absence of any partner/director, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm/company is duly registered under the applicable Indian Partnership Act 1932/ Companies Act 2013.
	3.	Receipts for payment made on account of work, when executed by a firm/company, must also be signed by all the partners/directors, except where contractors are described in their tender as a firm/company, in which case the receipts must be signed in the name of the firm by one of the partners/directors (duly authorized by the firm/company), or by some other person having due authority to give effectual receipts for the firm/company.
Applicable for Item Rate EPC Tender	4	The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring (less than and equal to) fifty paisa and considering more than fifty paisa as rupee one. In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, then such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer. If the revised tendered amount (worked out on the basis of quoted rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tender, among such contractors, shall be decided by draw of lots, In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted already at the time of submission of tender, then such revised offer shall be treated as invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited. In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

		Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the retendering process of the work.
Applicable for Percentage Rate EPC Tender only	4A	In case of Percentage Rate EPC tenders, contractor shall fill up percentage below/ above (in figures as well as in words) the total estimated cost given in Schedule of Quantities, he will be willing to execute the work. The tender submitted shall be treated as invalid if :- i. The contractor does not quote percentage above/below on the total amount of tender or any section/sub head of the tender. ii. The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/sub head of the tender. iii. The percentage quoted above/below is different in figures & words on the total amount of tender or any section/sub head of the tender. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected.
	4B	In case the lowest tendered amount (estimated cost + amount worked on the basis of percentage above/below) of two or more contractors is same, such lowest contractors will be asked to submit sealed revised offer in the form of letter mentioning percentage above/ below on estimated cost of tender including all sub sections/sub heads as the case may be, but the revised percentage quoted above/below on tendered cost or on each sub section/ sub head should not be higher than the percentage quoted at the time of submission of tender. The lowest tender shall be decided on the basis of revised offers. In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited. If the revised tendered amount of two or more contractors received in revised offer is again found to be equal, the lowest tender, among such contractors, shall be decided by draw of lots & the lowest contractors those have quoted equal amount of their tenders. In case all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each contractor. Contractor(s), whose earnest money is forfeited because of nonsubmission of revised offer,

		shall not be allowed to participate in the re-tendering process of the work.
	5.	The officer inviting tender or his duly authorized representative will open tenders in the presence of any intending contractors who may be present at the time of opening of tenders
	6.	The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
	7.	The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgment or payment to the officer inviting tender and the contractor shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorized Cashier.
Applicable for Item Rate EPC Tender only	8.	In the case of Item Rate EPC Tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate EPC tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly. However, if a tenderer quotes nil rates against any item in item rate EPC tender, the tender shall be treated as invalid and will not be considered as lowest tenderer and earnest money deposited shall be forfeited.
Applicable for percentage Rate EPC Tender only	9.	In case of Percentage Rate EPC Tenders only percentage quoted shall be considered. Any tender containing item rates is liable to be rejected. Percentage quoted by the contractor in percentage rate EPC tender shall be accurately filled in figures and words, so that there is no discrepancy.
Applicable for Percentage Rate EPC Tender only	10.	In Percentage Rate EPC Tender, the tenderer shall quote percentage below/above (in figures as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and the same should be written in figures as well as in words in such a way that no interpolation is possible. In case of figures, the word 'Rs.'

		should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs. 2.15P and in case of words, the word 'Rupees' should precede and the word 'Paisa' should be written at the end
	11.	i. The Contractor whose tender is accepted, will be required to furnish performance guarantee at specified percentage of the tendered amount as mentioned in NIT and within the period specified in SCC. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee of any Commercial Bank. ii. The contractor whose tender is accepted will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 5% of the tendered amount of the work. The Security deposit will be collected by deductions from the running bills as well as final bill of the contractor at the rates mentioned above. The Security amount will also be accepted in the shape of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks will be accepted for this purpose provided confirmatory advice is enclosed.
	12.	On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.
	13.	GST or any other tax applicable in respect of inputs procured by the contractor for this contract shall be payable by the Contractor and Government will not entertain any claim whatsoever in respect of the same. However, component of GST at time of supply of service (as provided in CGST Act 2017) provided by the contract shall be varied if different from that applicable on the last date of receipt of tender including extension if any. Accordingly payment or recovery shall be done.
	14.	The contractor shall give a list of WAPCOS and SSB employees related to him.
	15.	The tender for composite work includes, in addition to building work, all other works such as sanitary and water supply installations drainage installation, electrical work, horticulture work, roads and paths etc. as mentioned in the scope of work
	16.	The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and WAPCOS may in his discretion, without prejudice to any other right or remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

2.0 CONDITIONS OF CONTRACT

Definitions	i)	The EPC Contract means the documents forming the tender and acceptance thereof and the formal agreement executed between the WAPCOS and the Contractor, together with the documents referred to therein including conditions, specifications, designs, drawings and instructions issued from time to time by the Engineer-in- Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another..
	ii)	In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:- i. The expression, works or work shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional ii. The Site shall mean the land, places on, into or where work is to be executed under the contract or any adjacent land, path or street or where work is to be executed under the contract or any adjacent land, path or street which may be temporally allotted or used for the purpose of carrying out the contract. iii. The Contractor shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company. iv. "Employer" shall mean "WAPCOS Limited", A Government of India undertaking- Ministry of Jal Shakti, for execution of the Work / Project as mentioned in NIT. Having their Registered office at 5th floor, Kailash building, 26-Kasturba Gandhi Marg, New Delhi-110001, India & include their successors & permitted assigns as well as their authorized officer / representatives v. The "WAPCOS Limited" shall mean WAPCOS Limited. vi. The expression **works or Project** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional vii. The **Engineer-in-Charge** means the Engineer Officer who shall supervise and be in charge of the work and who shall sign the

		contract on behalf of the WAPCOS as mentioned in Special Conditions of Contract. viii. **Accepting Authority** shall mean the authority mentioned in Special Conditions of Contract. ix. **Tenderer / Bidder** shall mean the firm/party who intends to participate in this Notice Inviting Tender x. **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Government's faulty design of works. xi. **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Special Conditions of Contract to cover, all overheads and profits. xii. **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the government mentioned in Special Conditions of Contract hereunder, with the amendments thereto issued upto the date of receipt of the tender. xiii. **District Specifications** means the specifications followed by the State Government in the area where the work is to be executed. xiv. The **Contractor/Successful Bidder** shall mean the firm or company whose bid has been accepted by WAPCOS. xv. **Consultant** shall mean any consultant nominated by the WAPCOS xvi. **Tendered value** means the value of the entire work as stipulated in the letter of award. xvii. **Date of commencement of work:** The date of commencement of work shall be the date of start as specified in Special Conditions of Contract or the first date of handing over of the site, whichever is

		later, in accordance with the phasing if any, as indicated in the tender document.
Scope and Performance	iii)	Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
	iv)	Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
	v)	The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.
Works to be carried out	vi)	The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities/ Building Components shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
Sufficiency of Tender	vii)	The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the cost quoted in the Schedule of Quantities/ Building Components, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
Discrepancies and Adjustment of Errors	viii)	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.
	8.1	In the case of discrepancy between the schedule of Quantities/Building Components, the Specifications and/ or the Drawings, the following order of preference shall be observed:- i. Description of Schedule of Quantities ii. Particular Specification and Special Condition, if any. iii. Drawings. iv. Standard Specifications. v. Indian Standard Specifications of B.I.S.
	8.2	If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
	8.3	Any error in description, quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the works

		comprised therein according to drawings and specifications or from any of his obligations under the contract.
Signing of Contract	ix)	The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of:- i. The notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto. ii. Special Conditions of Contract consisting of: a) Various standard clauses with corrections up to the date stipulated in Special Conditions of Contract along with annexures thereto. b) Safety Code. c) Model Rules for the protection of health, sanitary arrangements for workers employed WAPCOS or its contractors. d) Contractor's Labour Regulations. e) List of Acts and omissions for which fines can be imposed. iii. No payment for the work done will be made unless contract is signed by the contractor.

3.0 CLAUSES OF CONTRACT

CLAUSE 1: PERFORMANCE GUARANTEE

i. The contractor shall submit an irrevocable **Performance Guarantee of 5% (Five percent) of the tendered amount** in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Special Conditions of Contract from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in Special Conditions of Contract on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This Guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks. In case a fixed deposit receipt of any Bank is furnished by the contractor to the Government as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Government to make good the deficit.

ii. **The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 2 year claim period beyond** the date of completion of all contractual obligations of the contractor, including Defect Liability Period (DLP). In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Security extended to cover such enlarged time. The performance Security shall be refunded to the contractor without interest, after he duly performs and completes all obligations under the contract not later than 365 days of completion of the Defect Liability Period.

iii. The Engineer-in-Charge shall make a claim under the performance guarantee except for amounts to which the WAPCOS is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.
b) Failure by the contractor to pay WAPCOS any amount due, either as agreed bythe contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer in-Charge.

i. In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the WAPCOS.

ii. The performance Guarantee shall be refunded to the contractor after recording successful Completion of Defect Liability Period.

CLAUSE 1A: RECOVERY OF SECURITY DEPOSIT

The Bidder whose tender(s) may be accepted shall permit WAPCOS at the time of making any payment to Contractor for work done under the contract to deduct a sum at the rate of 5% from each running and final bill excluding GST.

The contractor may, at his option replace the retention amount with an unconditional BG at the following stages:

i) After the amount reaches half the value of the limit of retention money; and
ii) After the amount reaches the maximum limit of retention money. One-half of the retention money (or BG, which replaced retention money) shall be released on the issue of the taking-over certificate; if the Taking Over Certificates (TOCs) are issued in parts, then in such proportions as the engineer may determine, having regard to the value of such part or section. The other half of the retention money (or BG, which replaced the retention money) shall be released upon expiration of 365 days after the DLP of the works or final payment, whichever is earlier, on certification by the engineer. In the event of different defect liability periods being applicable to different sections or parts, the expiration of defect liability period shall be the latest of such periods.

The Security Deposit shall be released after 6 months of successful Completion of Defect Liability Period.

CLAUSE 2: COMPENSATION FOR DELAY i.e. LIQUIDITY DAMAGES

If the contractor fails to maintain the required progress or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under purview of the Contract on account of such breach, pay compensation for delay i.e. Liquidity Damage, a sum not less than 0.50% of the Contract Price as aforesaid for each week and limited to 10% of the Contract Price.

In case Liquidity Damage imposed by Principal Employer to the project at any point of time, then full amount of Liquidity Damage (10% of the Contract Price) will be recovered from the up-coming

interim bills/ final bill. If the amount of up-coming interim bills/ final bill is less than the amount of Liquidity Damage, then balance amount of Liquidity Damage will be recovered from the Performance Security, Security Deposit and any other financial deposit of Contractor with Employer.

CLAUSE 2A: INCENTIVE FOR EARLY COMPLETION -----NOT APPLICABLE

In case, the contractor completes the work ahead of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work X stipulated period/tendered cost), a bonus @ 1% (one per cent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in 'Special Conditions of Contract'.

CLAUSE 3: WHEN CONTRACT CAN BE DETERMINED

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

i. If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.

ii. If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.

iii. If the contractor fails to complete the work or section of work with individual date of completion on or before the stipulated or justified extended date, on or before such date of completion; and the Engineer in Charge without any prejudice to any other right or remedy under any other provision in the contract has given further reasonable time in a notice given in writing in that behalf as either mutually agreed or in absence of such mutual agreement by his own assessment making such time essence of contract and in the opinion of Engineer-in-Charge the contractor will be unable to complete the same or does not complete the same within the period specified.

iv. If the contractor persistently neglects to carry out his obligations under the contract and/ or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

v. If the contractor shall offer or give or agree to give to any person in WAPCOS service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for WAPCOS.

vi. If the contractor shall enter into a contract with WAPCOS in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.

vii. If the contractor had secured the contract with WAPCOS as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.

viii. If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.

ix. If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

x. If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.

xi. If the contractor assigns (excluding part(s) of work assigned to other agency(s) by the contractor as per terms of contract), transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer –in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the WAPCOS shall have powers:

(a) To determine the contract as aforesaid so far as performance of work by the Contractor is concerned (of which determination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, in addition to Compensation for delay, the Security Deposit already recovered, Security deposit payable and Performance Guarantee under the contract shall be forfeited.

(b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work including any new items needed to complete the work. In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 3A

In case, the work including planning, designing and execution as per scope of contract cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or 180 days whichever is higher, either party may close the contract by giving notice to the other party stating the reasons. In such eventuality, the Performance Guarantee of the contractor shall be refunded within 30 days of closing of the contract.

Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party.

CLAUSE 4: CONTRACTOR LIABLE TO PAY COMPENSATION EVEN IF ACTION NOT TAKEN UNDER CLAUSE 3

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

CLAUSE 5: TIME AND EXTENSION FOR DELAY

The time allowed for execution of the Works as specified in the Special Conditions of Contract or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in Special Conditions of Contract or from the date of handing over of the site as notified by the Engineer-in-Charge, whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid and such default continues even after 10 days after a notice in writing has been given by the Engineer in charge, the performance guarantee shall be forfeited by the Engineer in Charge and shall be absolutely at the disposal of the WAPCOS without prejudice to any other right or remedy available in law. The contract shall stand determined when such decision regarding the forfeiture of the performance guarantee is communicated to the contractor.

5.1 The contractor shall within 10 (ten) working days of award of work, submit a time program to the Engineer-in Charge. Such program shall be made in due consideration of :

a) Schedule of handing over of site as specified in the Special Conditions of Contract.

b) Schedule of issue of designs as specified in the Special Conditions of Contract,

Further, program shall be prepared using the mutually agreed format/software or in other format/software as directed by Engineer-in-Charge. The said program shall be in direct relation to the time stated in the Contract document for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades/ sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor, within the limitations of overall time imposed in the Contract documents

The Engineer-in-Charge shall within 10 (ten) working days of receipt of such program chart, make modifications, if any and communicate the approved program to the contractor. In case of non-submission of construction program by the contractor, the program prepared by the Engineer-in-Charge shall be deemed to be final. Such program by the Engineer-in-Charge shall not relieve the contractor of any of the obligations under the contract.

PROGRAMME CHART

(i) The Contractor shall prepare an integrated programme chart in MS Project/Primavera software for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in- Charge within ten days of award of the contract. A recovery of Rs. 2500/- (for works costing upto Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the above programme.

(ii) The programme chart should include the following:

(a) Descriptive note explaining sequence of the various activities.
(b) Network (PERT / CPM / BAR CHART).
(c) Programme for procurement of materials by the contractor.

Programme of procurement of machinery / equipments having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. In addition to above, to achieve the progress of Work as per programme, the contractor must bring at site adequate shuttering material required for cement concrete and R.C.C. works etc. for three floors within one month from the date of start of work till the completion of RCC work as per requirement of work. The contractor shall submit shuttering schedule adequate to complete structure work within laid down physical milestone.

(iii) If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones, the contractor shall produce a revised programme within 7 (seven) days, showing the modifications to the approved programme to ensure timely completion of the work. The modified schedule of programme shall be approved by the Engineer in Charge. A recovery of Rs. 2500/- (for works costing upto Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the modified programme.

(iv) The submission for approval by the Engineer-in-Charge of such programme or such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

(v) The contractor shall submit the progress report using MS Project/Primavira software with base line programme referred above along with photographs of the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs. 2500/ - (for works costing upto Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the monthly progress report (minimum- 3 sets) .

5.2 If the work(s) be delayed by :-

(i) force majeure, or
(ii) abnormally bad weather, or
(iii) serious loss or damage by fire, or
(iv) civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
(v) delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
(vi) any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control.

Then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the authority as indicated in Special Conditions of Contract.

The said authority, on receipt of such notice, considering the factual ground situation, give a fair and reasonable 'justified extension of time' and reschedule the mile stones for completion of work.

The contractor shall have no claim of damages against the delays listed in this sub clause i.e. sub clause 5.2. The contractor shall have no claim of damages for extension of time granted or rescheduling of milestone/s for events listed in sub clause 5.2.

5.3 Delays attributable to the WAPCOS and the Concurrent delays:

In case the work is hindered, by the WAPCOS or for any reason / event, for which the WAPCOS is responsible, the Contractor shall immediately give notice thereof to the authority indicated in Special Conditions of Contract. The said authority shall, after verification of facts, give a fair and reasonable 'justified extension of time' and reschedule the mile stones for completion of work. Such extension of time or rescheduling of milestones shall be without prejudice to any other right or remedy of the parties in contract or in law, provided further that for the concurrent delays i.e. the delays occurring concurrently due to the defaults of both the parties, the contractor be entitled for extension of time but shall have no claim of damages.

5.4 Rescheduling of milestones and 'Justified extended date'

The request for rescheduling the Mile stones or extension of time, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed forms i.e. Form of application by the contractor for seeking rescheduling of milestones or Form of application by the contractor for seeking extension of time to the authority as indicated in Special Conditions of Contract. The Contractor shall indicate in such a request the period by which rescheduling of milestone/s or extension of time is desired.

The authority as indicated in Special Conditions of Contract, after examining the request, shall give a fair and reasonable 'justified extension of time' for completion of work and simultaneously reschedule the mile stones. In event of non-application by the contractor for extension of time, the authority as indicated in Special Conditionas of Contract, after affording opportunity to the contractor, may give, fair and reasonable justified extension and reschedule the milestones, within a reasonable period of occurrence of the event causing delay. Such justified extension of time shall determine the 'justified extended date' of completion of work.

5.5 Delays beyond the 'justified extended date'

(delays attributable solely to the contractor):

In case the work is delayed by reasons solely attributable to contractor i.e. for the reasons beyond the events/reasons stated in clause 5.2 & clause 5.3, requiring the execution of work beyond the 'justified extended date' (as stated in clause 5.4), the authority indicated in schedule F, without prejudice to the provisions under clause 3, may grant extension of time required for completion of work without rescheduling the milestones and without altering the 'justified extended date'. In such case, the contractor shall be liable for levy of compensation for such delay/such period of extension of time (i.e. for the period beyond the 'justified extended date' as determined in clause 5.4) and this default of contractor shall be dealt in conjunction with clause 2 of contract document.

5.6 It is a term of contract that the authority indicated in Special Conditions of Contract while deciding the extension of time case as per clause 5.1 to 5.5, shall also segregate the overall period of delay in following categories :

a) delays due to reasons beyond the control of both parties (under clause 5.2)
b) delays attributable solely to the WAPCOS (under clause 5.3)
c) concurrent delays (under clause 5.3)
d) delays solely attributable to contractor (under clause 5.5)

5.7 Online record of hindrances:

The Engineer-in-Charge may require the contractor to give notice of hindrances on any online system devised by him. All the notices of hindrances have to be submitted through such online system by the contractor timely to claim extension of time/ rescheduling of milestone(s). The contractor shall not be entitled for any damages incase such online notices are not given timely by the contractor.

CLAUSE 6 : COMPUTERIZED MEASUREMENT BOOK

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements as per the stage payments mentioned in Schedule F having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the WAPCOS so that a complete record is obtained of all the stages of works performed under the contract.

All such measurements recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative. After the necessary corrections made by the

Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in- Charge for the dated signatures by the Engineer-in- Charge and the contractor or their representatives in token of their acceptance.
Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the WAPCOS a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and/or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.

The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct. No cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the WAPCOS. Thereafter, the MB shall be taken in the Divisional Office records, and allotted a number as per the Register of Computerized MBs. This should be done before the corresponding bill is submitted to the Division Office for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record.

The contractor shall also submit to the Engineer-in-Charge separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the bill. Thereafter, this bill will be processed by the Division Office and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements by the Engineer-in- Charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the contract notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom.

The contractor shall give not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the WAPCOS to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 7 : PAYMENT ON INTERMEDIATE CERTIFICATE TO BE REGARD AS ADVANCE

The running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements as per Clause 6 on the format of the WAPCOS in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Special Conditions of Contract, in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified In the event of the failure of the contractor to submit the bills, no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge.

An amount of ad-hoc payment not less than 75% of the net amount of the bill under check, shall be made within 10 working days of submission of the bill. The remaining payment is also to be made after final checking of the bill within 28 working days of submission of bill by the contractor.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming If the revised tendered amount (worked out on the basis of quoted rate of individual items) part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the WAPCOS to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

Clause 7A

No Running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.

CLAUSE 8 : COMPLETION CERTIFICATE AND COMPLETION PLANS

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE 8A : COMPLETION PLANS TO BE SUBMITTED BY THE CONTRACTOR

The contractor shall submit completion plans for Internal and External Civil, Electrical and mechanical Services within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum of 0.1 % (zero point one percent) of Tendered Value or limit prescribed in Schedule whichever is more as may be fixed by the authority as mentioned in Schedule F and in this respect the decision of the that authority shall be final and binding on the contractor.

CLAUSE 9 : PAYMENT OF FINAL BILL

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period of three months the period being reckoned from the date of receipt of the bill by the Engineer-in- Charge or his authorized Asstt. Engineer.

If the final bill is submitted by the contractor within the period specified above and delay in payment of final bills is made by the WAPCOS after prescribed time limit, a simple interest @ 5 % (five percent) per annum shall be paid to the contractor from the date of expiry of prescribed time limit, provided the final bill submitted by the contractor is found to be in order

CLAUSE 9A : PAYMENT OF CONTRACTOR'S BILLS TO BANKS

Payments due to the contractor may, if so desired by him, be made to his bank, registered financial, co-operative or thrift societies or recognized financial institutions instead of direct to him provided

that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank, registered financial, co-operative or thrift societies or recognized financial institutions to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by Government or his signature on the bill or other claim preferred against Government before settlement by the Engineer-in-Charge of the account or claim by payment to the bank, registered financial, co-operative or thrift societies or recognized financial institutions. While the receipt given by such banks registered financial, co-operative or thrift societies or recognized financial institutions shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible present his bills duly receipted and discharged through his bank, registered financial, co-operative or thrift societies or recognized financial institutions.

Nothing herein contained shall operate to create in favour of the bank; registered financial, co-operative or thrift societies or recognized financial institutions any rights or equities vis-à-vis the WAPCOS.

CLAUSE 10A: MATERIALS TO BE PROVIDED BY CONTRACTOR

The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the WAPCOS

The contractor shall, at his own expense and without delay, supply to the Engineer-in- Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in- Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons

to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.

The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment.

Minimum 01 year warranty for Mechanical & Electrical Equipments and other bought out items, at the discretion of WAPCOS Limited, if supplied directly by the contractor. The standard warranty period offered by the Manufacturer shall be retained, in case the original warranty period is more than one year.

CLAUSE 10B :

(i) SECURED ADVANCE ON NON-PERISHABLE MATERIALS

The contractor, on signing an indenture in the form to be specified by the Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 75% of the assessed value of any materials which are in the opinion of the Engineer-in-Charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/ deducted from the next payment made under any of the clause or clauses of this contract.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

(ii) MOBILISATION ADVANCE

Mobilization advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work. Such advance shall be in two or more installments to be determined by the Engineer-in- Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Before any installment of advance is released, the contractor shall execute Bank Guarantee from a scheduled commercial Bank for the amount equal to 110% of the amount of advance and valid for the contract period. This (Bank Guarantee from Scheduled Commercial Bank on prescribed format for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.

(iii) PLANT MACHINERY & SHUTTERING MATERIAL ADVANCE

An advance for plant, machinery & shuttering material required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery which in the opinion of the Engineer-in-charge will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 5% percent of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income- Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs. 50,000/- Seventy five per cent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:

1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.
2. Engineer in Charge, and
3. The contractor.

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in working order and are maintained in working order; (c) hypothecated to the WAPCOS as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and form work shall be treated as plant and equipment. The contractor shall insure the Plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

(iv) INTEREST & RECOVERY

The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest at the rate of 10 percent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractors bills commencing after first ten percent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

If the circumstances are considered reasonable by the Engineer-in-Charge, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended at the discretion of the Engineer-in-Charge.

CLAUSE 10C : PAYMENT ON ACCOUNT OF INCREASE IN PRICE / WAGES DUE TO STATUTORY ORDER

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty) beyond the prices/wages prevailing at the time of the last stipulated date of receipt of tenders including extensions, if any, for the work during contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied and provided further that any such increase shall be limited to the price/wages prevailing at the time of updated stipulated date of completion considering effect of extra work (extra time to be calculated on 338tilize basis only as cost of extra work x stipulated period/tendered amount).

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty), WAPCOS shall in respect of materials incorporated in the works (excluding the materials covered under Clause 10CA and not being material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 hereof) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge may call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages. The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

For this purpose, the labour component of the work executed during period under consideration shall be the percentage as specified in Special Conditions of Contract, of the value of work done during that period and the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

CLAUSE 10CA :PAYMENT DUE TO VARIATION IN PRICES OF MATERIALS AFTER RECEIPT OF TENDER

If after submission of the tender, the price of materials specified in Special Conditions of Contract increases/ decreases beyond the base price(s) as indicated in Special Conditions of Contract for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of Contract including the justified period extended under the provisions of Clause 5 of the Contract without any action under Clause 2.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost).

The increase/decrease in prices of cement, steel reinforcement, structural steel and POL shall be determined by the Price indices Economic Advisor to Government of India, Ministry of Commerce and Industry. For other items provided in the Special Conditions of Contract, this shall be determined by the All India Wholesale Price Indices of materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry. Base price for cement, steel reinforcement, structural steel and POL shall be as issued by the state / Central Govt. from time to time. In case, price index of a particular material is not issued by Ministry of Commerce and Industry, then the price index of nearest similar material as indicated in Special Conditions of Contract shall be followed.

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the formula given Clause 10CA of General Conditions of Contract.

CLAUSE 10CC : PAYMENT DUE TO INCREASE/DECREASE IN PRICES/WAGES (EXCLUDING MATERALS COVERED UNDER CLAUSE 10 CA) AFTER RECEIPT OF TENDER FOR WORKS

If the prices of materials (not being materials supplied or services rendered at fixed prices by the WAPCOS in accordance with clause 10 & 34 thereof) and/or wages of labour required for execution of the work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2. However, for the work done during the justified period extended as above, the compensation as detailed below will be limited to prices/wages prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost). No such compensation shall be payable for a work for which the stipulated period of completion is equal to or less than the time as specified in Special Conditions of Contract. Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the provisions mentioned in the Clause 10CC of General Conditions of Contract.

CLAUSE 10D : DISMANTLED MATERIAL WAPCOS PROPERTY

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as WAPCOS's property and such materials shall be disposed off to the best advantage of WAPCOS according to the instructions in writing issued by the Engineer-in-Charge.

CLAUSE 11 :WORKS TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS, ORDERS ETC.

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge. Contractor shall be furnished free of charge one copy of the contract documents.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

At least to 10% of prescribed Tests as per Central Public Works Department Manual/IS Codes of construction materials shall be carried out from the outside approved/NABL recognized Laboratory as may be approved by WAPCOS without any extra expenditure to WAPCOS.

The Contractor shall establish a field test laboratory on the site with latest equipment's for carrying out field tests of construction materials and will maintain proper records of all the test results.

CLAUSE 12 : DEVIATIONS / VARIATIONS EXTENT AND PRICING

The Engineer-in-Charge shall have power (i) to make alterations in, additions to or substitutions for the original scope of work as defined in the contract, that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or due to any other reason (save except Clause-13), the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any change in the scope of work as defined in the contract, which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same terms and conditions in all respects, except for increase/ decrease in the cost and additional time due to change of scope, to be determined based on the sub-clauses hereunder :

a) The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the contractor, as follows:
   (i) In the proportion which the additional cost of the altered, additional or substituted works, bears the original tendered value plus
   (ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

b) Payment of deviations/variations beyond 0.25% of the accepted tendered amount.

In case there is any change in scope as defined in the contract, the contractor shall carry out the changes as per direction of Engineer in Charge and nothing extra shall be payable to the contractor on account of same if the additional cost of such work is up to 0.25% (zero point two five percent) of the accepted tendered amount and worked out as per sub-clause 12.3 below. Variations/deviations upto 0.25% (zero point two five percent) of the accepted tendered amount shall be deducted from overall variations/ deviations for making payment.

12.3 DETERMINATION OF RATES

In the event, there is any deviations/variations in work as defined in the contract, the contractor shall submit the complete proposal to Engineer-in-charge within 15 days duly supported with :-

a) Analysis of rates for items involved, along with relevant documents, rates of materials, tools/plants and labour, etc.
b) The impact, if any, which the deviations/variations is likely to have on the project completion schedule,

On receipt of such proposal, either individually or covering group of items, the Engineer-in-charge shall examine the proposal regarding its admissibility and finalize the proposal/rates within 45 days after receipt of proposal with all requisite details and documents from the contractors, after giving due consideration to the proposal, analysis and rates of materials and labours, etc.

12.3.1 The increase/decrease in the rates due to deviations/variations shall be decided based on the following criteria:-

a) Pricing of deviations

a) If the item of work as stipulated in the schedule of quantity/scope of work deviates on plus side, then the rate for the deviated quantity shall be paid at the agreement rate upto the deviation limit as specified in Special Conditions of Contract with the same terms & conditions of the contract. Beyond deviation limit as specified in the Special Conditions of Contract, rate shall be payable on market rates to be determined based on the relevant documents and prevailing market rates, as per Para (ii) below
b) If the item of work as stipulated in the schedule of quantity/scope of work deviates on minus side, then the amount for such deviated quantity shall be deducted proportionately at the agreement rate.

b) Pricing of variations

If there are changes in the quantity/ specifications/ alterations/ substitutions/ additions, etc. in the items, other than mentioned in para- (i) above, the rates shall be determined based on detailed analysis of rates with original stipulated scope of items & newly proposed/provided items. The difference of rates so determined shall be payable to/ recoverable from the contractor. The rates for both the components i.e. materials &labour shall be based on prevailing market rates. The rate finalized by the Engineer-in-Charge shall be final and binding.

12.3.2 In case of either non-submission of timely proposal or incomplete proposal by the contractor for deviations/variations, the Engineer-in-Charge shall give final opportunity to the Contractor to submit the complete proposal for change of cost within next 15 days. In case of non-submission or further incomplete submission by the contractor within the stated period, the Engineer-in-Charge shall initiate the proposal and decide the change of cost. In such case the proposal finalized by the Engineer-in-Charge shall be final and binding on the contractor.

12.4 Restrictions on Deviations/Variations

i) Work(s) due to deviations/variations shall be executed only after getting the instructions of Engineer-in-charge, save except to meet any work of emergent nature.

ii) Notwithstanding anything to the contrary in this clause 12, any change arising from default of the contractor in the performance of his obligations under this agreement shall not be deemed to be deviations/variations, and shall not result in any adjustment of the contract price or the project completion schedule.

CLAUSE 13: FORECLOSURE OF CONTRACT DUE TO ABANDONMENT OR REDUCTION IN SCOPE OF WORK

If at any time after acceptance of the tender, Engineer-in-charge shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates, full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure;

(i) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.

(ii) WAPCOS shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work). For materials taken over or to be taken over by WAPCOS, cost of such materials as detailed by Engineer-in- Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

(iii) If any materials supplied by WAPCOS are rendered surplus, the same except normal wastage shall be returned by the contractor to WAPCOS at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to WAPCOS stores, if so required by WAPCOS, shall be paid.

(iv) Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.

The contractor shall, if required by the Engineer- in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.

The reasonable amount of items on (i), (iii) and (iv) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the WAPCOS as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the WAPCOS from the contractor under the terms of the contract.

In the event of action being taken under Clause 13 to reduce the scope of work, the contractor may furnish fresh Performance Guarantee on the same conditions, in the same manner and at the same rate for the balance tendered amount and initially valid up to the extended date of completion or stipulated date of completion if no extension has been granted plus minimum 180 days beyond that. Wherever such a fresh Performance Guarantee is furnished by the contractor the Engineer-in-Charge may return the previous Performance Guarantee

CLAUSE 14 : Pre-Construction Activities

The data supplied by the WAPCOS, if any, are for General Guidance only. The contractor shall be responsible for carrying out pre- construction activities for construction of work as defined in the tender documents. The contractor shall also carry out site investigations to verify site details / Data at his own cost.

CLAUSE 15 : SUSPENSION OF WORK

(i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:

(a) on account of any default on the part of the contractor or;

(b) for proper execution of the works or part thereof for reasons other than the default of the contractor; or

(c) for safety of the works or part thereof. The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

(ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

(a) the contractor shall be entitled to an extension of time equal to the period of every such suspension plus 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;

(b) If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

(iii) If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in subpara (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission

of such part by WAPCOS or where it affects whole of the works, as an abandonment of the works by WAPCOS, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by WAPCOS, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

CLAUSE 16 : ACTION IN CASE WORK NOT DONE AS PER SPECIFICATIONS

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-ln-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the WAPCOS or any organization engaged by the WAPCOS for Quality Assurance and of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates incharge of the work or to the Chief Engineer in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the WAPCOS for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in the case of work costing Rs. 10 Lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in- Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE 17 : DAMAGES AND DEFECTS LIABILITY

17.1 During Progress of Work

If the contractor or his working staff or workers damage any part of the work in the scope of contract, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass, grassland, cultivated ground, etc. contiguous to the premises on which the work or any part of it is being executed, the contractor shall make good the same at his own cost.

Contractor shall repair/replace and restore the damaged structures/services in a time bound manner as required and as directed by the Engineer-in-Charge. Contractor shall not be given any benefit of hindrance caused in the execution of the work owing to such damaged structure/service and time taken in its restoration by the contractor.

17.2 During Defect Liability Period

The contractor shall be responsible for all the defects and deficiencies in the work within the scope of this contract, during the defect liability period which shall be for 2 (two) years after the date of actual completion of work as recorded by the Engineerin-Charge. The liability of contractor for defects and deficiencies may arise due to:

a) Improper planning and design of the project, if in the scope of contract.
b) Works, Tools, Plant & Machinery, Materials or Workmanship not being in accordance with this contract.
c) Improper upkeep & maintenance during construction of the work.
d) Improper upkeep, operation and/or maintenance during defect liability period, if these are in the scope of this contract.
e) Failure by the contractor to comply with any other obligation under this contract.

Such defects and deficiencies shall be made good by the contractor at his own cost after getting instructions/notice from the Engineer-in-Charge within the time period specified in such instructions/notice.

However, contractor need not wait for instructions/notice from Engineer-in-Charge for rectification of defects in work which come to his notice and he should initiate action for needful rectification of defect on priority, under intimation to Engineer-in-Charge, to avoid any untoward incident.

17.3 Structural Soundness

The contractor shall follow the good engineering practice for safety, serviceability and structural soundness of the building/ structure/road work etc. as covered in the scope of contract.

17.3.1 Structure design in the scope of contract

The contractor shall have obligation to rectify all defects in the structural elements or any other part of building/structure/road etc. due to design deficiency at his own cost for 10 (ten) years from the date of completion as recorded in the completion certificate by the Engineer-in-Charge. Such defects shall be made good by the contractor at his own cost after getting instructions/notice from the Engineer-in-Charge within the time period specified in such instructions/notice and as per the methodology duly approved by the Engineer-in-Charge.

17.3.2 Structure design not in the scope of contract

The contractor shall not be liable for design deficiency.

17.3.3 Liability for execution

The contractor shall be fully liable for any deficiency in structural soundness of work owing to execution of the work under the scope of this contract. The contractor shall have obligation to rectify all defects in the structural elements owing to any deficiency in execution of work at his own cost for 10 (ten) years from the date of completion as recorded in the completion certificate by Engineer-in-Charge. Such defects shall be made good by the contractor at his own cost after getting instructions/notice from the Engineer-in-Charge within the time period specified in such instructions/notice and as per methodology duly approved by the Engineer-in-Charge.

17.4 Methodology for rectification of defects

The design, methodology and quality of rectification of defects carried out by the contractor shall be as per sound engineering practice.

17.5 Contractor's failure to rectify defects as defined in the sub-clauses 17.1, 17.2, 17.3 & 17.4

In the event that the contractor fails to repair or rectify the defect or deficiency within the period specified by the Engineer-in-Charge, the Engineer-in-Charge shall be entitled to get the same repaired, rectified or remedied at the contractor's cost and recover such amount from any dues like performance guarantee, security deposits etc. available with Engineer-in-Charge. Engineer-in-Charge may take action for debarment of contractor from tendering in WAPCOS by following due process. For inacti on or failure to rectify the defects covered under sub clause 17.3 within specified time limit, the Engineer-in-Charge may also initiate legal and/or other actions under other applicable laws in addition to other remedies available in the contract.

17.6 Release of security deposit

The security deposit of the contractor shall be retained from the RA bill sand Final Bills as specified in the Agreement. The security deposit shall be released after successful completion of defect liability period.

Provided further, that the security deposit shall be released within a month of its due date as stated above only if satisfactory performance is observed during the said period and after deduction of Government dues from the contractor, if any.

CLAUSE 18 : CONTRACTOR SUPPLY TOOLS & PLANTS ETC.

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants as specified in Special Conditions of Contract. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his

so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

CLAUSE 18A : RECOVERY OF COMPENSATION PAID TO WORKMEN

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensation Act, 1923, WAPCOS is obliged to pay compensation to a workman employed by the contractor, in execution of the works, WAPCOS will recover from the contractor, the amount of the compensation so paid; and, without prejudice to the rights of the WAPCOS under sub-section (2) of Section 12, of the said Act, WAPCOS shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by WAPCOS to the contractor whether under this contract or otherwise. WAPCOS shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to WAPCOS full security for all costs for which WAPCOS might become liable in consequence of contesting such claim.

CLAUSE 18B : ENSURING PAYMENT AND AMENITIES TO WORKERS, IF CONTRACTOR FAILS

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, WAPCOS is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the C.P.W.D. Contractor's Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by C.P.W.D. Contractors, WAPCOS will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the WAPCOS under sub-section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, WAPCOS shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by WAPCOS to the contractor whether under this contract or otherwise WAPCOS shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the WAPCOS full security for all costs for which WAPCOS might become liable in contesting such claim.

CLAUSE 19 : LABOUR LAWS TO BE COMPLIED BY CONTRACTOR

The contractor shall obtain a valid license under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with provisions of the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.

The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work

CLAUSE 19A

No labour below the age of fourteen years shall be employed on the work.

CLAUSE 19B : PAYMENT OF WAGES

(i) The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in the C.P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

(ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

(iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Contractor's Labour Regulations made by WAPCOS from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorizedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

   a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

   b) Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

(iv) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor's Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made thereunder from time to time.

(v) The contractor shall indemnify and keep indemnified WAPCOS against payments to be made under and for the observance of the laws aforesaid and the C.P.W.D. Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.

(vi) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

(vii) Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any

amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

(viii) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19C

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per C.P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay a penalty of Rs.200/- for each default and in addition, the Engineer-in- Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 19 D

The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge, a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:-

(1) The number of labourers employed by him on the work,
(2) Their working yours,
(3) The wages paid to them,
(4) The accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and
(5) The number of female workers who have been allowed maternity benefit according to Clause 19F and the amount paid to them.

Failing which the contractor shall be liable to pay to WAPCOS, a sum not exceeding Rs.200/- for each default or materially incorrect statement. The decision of the Engineer-In-Charge shall be final in deducting from any bill due to the contractor; the amount levied as fine and be binding on the contractor.

CLAUSE 19 E

In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by the WAPCOS and its contractors.

CLAUSE 19 F

Leave and pay during leave shall be regulated as follows:-

1. Leave :
   (i) in the case of delivery – maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day,
   (ii) in the case of miscarriage – upto 3 weeks from the date of miscarriage.
2. Pay :
   (i) in the case of delivery – leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.
   (ii) in the case of miscarriage – leave pay at the rate of average daily earning calculated on

the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.

3. Conditions for the grant of Maternity Leave:
   No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave.
4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in appendix –I and II, and the same shall be kept at the place of work.

CLAUSE 19 G

In the event of the contractor(s) committing a default or breach of any of the provisions of the WAPCOS, Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and' Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the Government a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 per cent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the provisions of the C.P.W.D. Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R& A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities hereinbefore mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be 350tilize350350 and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19 H

The contractor(s) shall at his/their own cost provide his/their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.

(i) (a) The minimum height of each hut at the eaves level shall be 2.10m (7 ft.) and the floor area to be provided will be at the rate of 2.7 sq.m. (30 sq.ft.) for each member of the worker's family staying with the labourer.

(b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.80m x 1.50m (6'x5') adjacent to the hut for each family.

I The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.

(d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.

(ii) (a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15 cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight.

(b) The contractor(s) shall provide each hut with proper ventilation.

I All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.

(d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed

(iii) **Water Supply** – The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/ their own cost make arrangements for laying pipe lines for water supply to his/ their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.

(iv) The site selected for the camp shall be high ground, removed from jungle.

(v) **Disposal of Excreta** – The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for the removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.

(vi) **Drainage** – The contractor(s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy.

(vii) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.

(viii) **Sanitation –** The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19 I

The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors' employ upon the work who may be incompetent or

misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/repair or renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour.

CLAUSE 19J

It shall be the responsibility of the contractor to see that the building under construction is not occupied by unauthorized person(s) during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building / buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a compensation shall be levied upto 5% of tendered value of work may be imposed by the WAPCOS whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, WAPCOS, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19K : Employment of Skilled / Semi Skilled Workers

The contractor shall, at all stages of work, deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from Industrial Training Institute/National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs. 100 per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

The contractor shall arrange on site training as per National Skill Development Corporation (NSDC) norms for at least 30% of the unskilled workers engaged in the project in coordination with the CPWD Regional Training Institute & National Skill Development Corporation (NSDC) for certification at the level of skilled/semi-skilled tradesmen. The cost of such training as stated above shall be born by the Contractor. The necessary space and workers shall be provided by the contractor and no claim what so ever shall be entertained.

Clause 19L: Contribution of EPF and ESI

The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis. The verification of deployment of labour will be done through biometric attendance system or any other suitable method by the Engineer in Charge. The applicable and eligible amount of EPF & ESI shall be reimbursed preferably within 7 days but not later than 30 days of submission of documentary proof of payment provided same are in order.

CLAUSE 20 : MINIMUM WAGES ACT TO BE COMPLIED WITH

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed thereunder and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 21 : WORK NOT TO BE SUBLET. ACTION IN CASE OF INSOLVENCY

The contract shall not be assigned or sublet without the written approval of the Engineer-in Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of WAPCOS in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the WAPCOS shall have power to adopt the course specified in Clause 3 hereof in the interest of WAPCOS and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22 : QUALITY ASSURANCE AND SUPERVISION FOR EXECUTION PART of WORK

22.1 Quality of Materials and Workmanship

(i) The Contractor shall ensure that the Materials and workmanship are in accordance with the requirements specified in this Agreement, Specifications and Standards and Sound Engineering practice. The work shall be of the specified quality and standard, both in respect of ingredients as well as the intended functions it is supposed to perform for service life.

(ii) The Contract warrants that all Materials shall be new, unused, not reconditioned, unless otherwise allowed as per contract or by Engineer-in-Charge, and in conformity with Specification and Standards, Applicable Laws and Sound Engineering Practice, and that the Contractor shall not use any materials which are generally recognized as being deleterious under Sound Engineering Practice.

22.2 Quality Assurance System

The Contractor shall devise a quality assurance mechanism to ensure compliance with the provisions of this Agreement (the “Quality Assurance Plan” or “QAP”).

(i) The Contractor shall, submit to the Engineer-in-Charge, its Quality Assurance Plan 15 (fifteen) days in advance of start of the execution stage specified in the NIT. The Engineer-in-Charge shall convey its comments to the Contractor within a period of 7 (seven) days of receipt of the QAP stating the modifications, if any, required and the Contractor shall incorporate those in the QAP conforming with the provisions of this clause. The QAP shall include the following:

a) Contractor’s Organization & structure, duties and responsibilities of individual key personnel, quality policy of contractor, procedure for control of non-conformities and corrective action, inspections and documentation.
b) Internal quality audit system.
c) Machinery, Shuttering, other Tool & Plants, etc. required to be deployed at site.
d) Method statement of important activities. These can be submitted as per the sequencing of the activities of the work.

e) Quality control mechanism including sampling and testing of Materials, test frequencies, standards, acceptance criteria, testing facilities, reporting, recording and interpretation of test results, approvals, proforma for testing and calibration in accordance with the Specifications and Standards and Sound Engineering Practice; and Material Lot size, number of required tests and frequency of testing for different construction materials.

   All the relevant and applicable codes, specifications and standards, as well as the acceptance criteria for various items of work, workmanship, materials and process employed needs to be mentioned.

f) Check-list for various items and materials.

g) Formats for site documentation, monthly reports on implementation of QAP.

(ii) Sampling of materials

All samples of materials including Cement Concrete Cubes shall be taken by the QA engineers deployed by the Contractor and shall be witnessed by the Engineer-in-Charge or his authorized representatives as specified in NIT. All the necessary assistance, facilities and safety shall be provided by the contractor. Cost of sample of materials and testing charges shall be borne by the contractor and he/she is responsible for safe custody of samples to be tested at site.

(iii) Testing of Materials

The contractor shall establish temporary field laboratory of adequate size with all necessary facilities. Field laboratory shall be equipped with the testing equipment for conducting routine field tests as per this contract. It will also have copies of standards, BIS codes, IRC codes, relevant publications.

All the tests in field lab setup at construction site shall be carried out by the QA Staff deployed by the contractor and shall be witnessed by the Engineer-in-Charge or his authorized subordinates as specified in NIT. The contractor shall provide all necessary facility to them for witnessing the tests in the field laboratory. In general, contractor shall carry out 90% of field tests in site laboratory and 10% tests shall be got carried out from outside laboratory as indicated below. Contractor shall endeavour to obtain test reports for tests conducted from outside laboratory in a reasonable time.

(iv) Maintenance of Register of Test –

- All the entries in the register of test are to be made by the designated QA Engineers of the contractor and same is to be regularly reviewed by thefield officers as well as the Engineer-in-Charge. The contractor shall allow inspection of such records any time as desired by Engineer-in-Charge or his authorized representative.
- All the tests carried out at construction site or outside laboratories are to be maintained by the contractor in the prescribed format in the test registers provided by the contractor and duly authenticated by Engineer-in-Charge.The test reports shall also be maintained in hard file.
- Contractor is responsible for maintenance and safe custody of all the test registers and test records.
- Mandatory test conducted as per approved proforma shall be attached with each Running bill. Submission of copy of all test registers and material at site register along with each alternate Running Account Bill and with Final Bill is mandatory.

(v) Maintenance of Material at Site (MAS) Register-

MAS register of the key materials including Cement and Steel Registers shall be maintained in the proforma approved by Engineer-in-Charge. All the entries in the MAS registers are made by the designated staff of the contractor and same is regularly reviewed by the field officers as well as the Engineer-in-Charge. Contractor is responsible for maintenance and safe custody of MAS registers.

(vi) The Contractor shall procure all relevant codes, publications, apparatus and instruments, fuel, consumables, water, electricity, labour, materials, samples and qualified personnel as are necessary for examining and testing the Works, Materials and workmanship in accordance with the Quality Assurance Plan.

(vii) All the cost of testing including cost of samples, packaging, transportation, testing charges of Construction, Materials and workmanship under this clause shall be borne by the contractor.

(viii) The contractor shall submit monthly quality progress report on implementation of the provisions of Quality Assurance Plan on the format approved by the Engineer-in-Charge.

22.3 Samples

The Contractor shall, at its own expense and without delay, provide the samples of Materials and relevant information like Manufacturer's test reports, standard samples of manufactured Materials and Samples of such other Materials as the Engineer-in- Charge may require for review and approvals in accordance with Clause 10A of GCC
before actual use.

22.4 Test

(i) For determining that the Works conform to the Specifications and Standards, the Engineer-in-Charge shall require the Contractor to carry out or cause to be carried out tests, at such time and frequency and in such manner as specified in this Agreementand in accordance with sound engineering practice for quality assurance. Frequency and the manner in which tests shall be conducted shall be in the following order of preference:

a) Contract provisions.
b) CPWD specifications.
c) BIS codes.
d) IRC codes.
e) MoRTH Specifications.
f) International Codes.
g) Manufacturer's specifications.

Outside tests shall be conducted at Government labs /IITs/NITs and other approved laboratories by the Engineer-in-Charge for testing of materials

(ii) The Contractor shall, with due diligence, carry out all the tests in accordance with the Agreement and furnish the results thereof to the Engineer-in-Charge. The Engineer-in-Charge or his authorized representative shall witness or participate during the testing as specified in NIT. The contractor shall provide all necessary assistance for witnessing/participating in the field tests.

(iii) In the event that results of any tests conducted under this clause establish any defects or deficiencies in the Works, the Contractor shall carry out remedial measures at its own

cost and furnish a report to the Engineer-in-Charge in this regard. The Engineer-in-Charge shall require the Contractor to carry out or cause to be carried out tests to determine that such remedial measures have brought the works into compliance with the Specifications and standards and the procedure shall be repeated until such Works conform to the Specifications and Standards.

22.5 Method Statement

The 'Method statement' is a statement by which the construction procedures for important activities are stated, checked, and approved. The method statement shall be prepared for important activities as identified by the contractor as mentioned in QAP or any other activity as instructed by Engineer-in Charge. The 'Method statement', should have a description of the item with elaborate procedure in steps to implement the same, the specifications of the materials involved, equipment to be deployed, measures for ensuring safety, their testing and acceptance criteria, precautions to be taken, mode of measurement, etc. The Contractor shall, at least 15 (fifteen) days prior to the commencement of activities, submit to the Engineer-in-Charge for review, the method statements proposed to be adopted for executing the various items of work. The Engineer-in-Charge shall complete the review and convey its comments, if any, to the Contractor within a period of 07 (seven) days from the date of receipt of the proposed methodology from the Contractor.

22.6 Inspection & review by the Engineer-in-Charge and External Audit.

The Engineer-in-Charge, his authorized subordinates, senior officers of WAPCOS, QA unit or any other third party may inspect and review the progress and quality of the work and issue appropriate directions to the Contractor for taking remedial action in the event the work is not in accordance with the provisions of this Agreement. The work may be inspected at any time/stage by external inspection teams like CTE or TE, Third Party Quality assurance agency, CPWD team etc. may conduct inspection of the quality of the works. The findings of the inspections shall be notified to the Contractor for taking remedial action in accordance with the agreement. The Contractor shall provide all assistance as may be required by the inspection teams in the conduct of its inspection here under

Suitable actions shall be taken as per the provisions contained in the relevant clauses of the agreement, if the work is not found to be as per specifications or quality as specified in the agreement.

22.7 Inspection of records

The Engineer-in-Charge or his authorized representative shall have the right to inspect the records of the Contractor relating to the works.

22.8 Inspection of Works

(i) The Engineer-in-Charge and his authorized subordinates shall at all times;
   (a) have full access to all parts of the site and to all places from which natural materials are being obtained for use in the works; and
   (b) during production, manufacture and construction at the site and at the place of production, be entitled to examine, inspect, measure and test the materials and workmanship and to check the progress of the manufacturer of Materials.

(ii) The Contractor shall give the Engineer-in-Charge and its authorized representative access, facilities and safety equipment for carrying out their obligations under this Agreement.

22.9 Examination of work before covering up/ Test Check of item of Work

In respect of the work which the Engineer-in-Charge or his authorized representatives are required to examine, inspect, measure or test before it is covered up or put out of view or any part of the work is placed thereon, the Contractor shall give notice to the Engineer-in-Charge whenever any such work is ready and before it is covered up. The Engineer-in-Charge shall then either carry out the examination, inspection or testing without unreasonable delay within 7 days, or promptly give notice to the Contractor that the Engineer-in-Charge does not require him to do so. Provided, however, that if any work is of a continuous nature where it is not possible or prudent to keep it uncovered or incomplete, the Contractor shall notify the schedule of carrying out such work to give sufficient opportunity, not being less than 3(three) business days' notice, to the Engineer-in-Charge to conduct its inspection, measurement or test while the work is continuing. Provided further that in the event the Contractor receives no response from the Engineer-in-Charge within a period of 3 (three) business days from the date on which the Contractor's notice hereunder is delivered to the Engineer-inCharge, the Contractor shall be entitled to assume that the Engineer-in-Charge would not undertake the said inspections.

22.10 Rejection

(i) If, as a result of an examination, inspection, measurement or testing, any Plant, Materials, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the Engineer-in-Charge may reject such piece of work, Plant, Materials, design or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the requirements of this Agreement.

(ii) If the Engineer-in-Charge requires a Piece of work, Plant, Material, design or workmanship to be retested, the tests shall be repeated on the same terms and conditions, as applicable in each case. If the rejection and retesting cause the WAPCOS to incur any additional costs, such costs shall be recoverable by the Engineer-in-Charge from the Contractor and may be deducted by the Engineerin-Charge from any amount due to be paid to the Contractor.

(iii) The Contractor shall not be entitled to any extension of time on account of rectifying any defect or retesting as specified in this clause.

(iv) Examination, inspection, measurement or testing of any Plant, Material, design or workmanship by the Engineer-in-Charge or its failure to convey its observations or to examine, inspect, measure or test shall neither relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Engineer-in-Charge be liable for the same in any manner.

22.11 Remedial Work

(i) Notwithstanding any previous test or certification, the Engineer-in-Charge may instruct the Contractor to:
   (a) remove from the site and replace any piece of work,plant or materials which are not in accordance with the provisions of this Agreement.
   (b) remove and re-execute any work which is not in accordance with the provisions of this Agreement and the Specification and Standards; and
   (c) execute any work which is urgently required for the safety of the Project, whether because of an accident, unforeseeable event or otherwise.

(ii) If the Contractor fails to comply with the instructions issued by the Engineer-inCharge under aforesaid para, within the time specified in the notice or as mutually agreed, the Engineer-in-Charge may get the work executed by another agency. The cost so incurred by the Engineer-in-Charge for undertaking such work shall, without prejudice to the rights of the Engineer-in-Charge to recover damages in accordance with the provisions of this Agreement, be recoverable from the Contractor and may be deducted by the Engineer-in-Charge from any amount due to be paid to the Contractor

22.12 Quality Control Records

The Contractor shall hand over authenticated copy of all its quality control records and documents to the Engineer-in-Charge before the Completion Certificate is issued.

22.13 Video recording

During the Construction Period, the Contractor shall provide to the Engineer-inCharge for every calendar quarter, a video recording which will be compiled into a 15 (fifteen) minutes digital video covering the status and progress of work in that quarter. Video recording should show different activities, stage of work, quality assurance activities etc. including animation, graphs, digital maps, commentary, sub titles, etc. spread over the quarter. The video recording shall be provided to the Engineerin-Charge no later than 15 (fifteen) days after the close of each quarter to be reckoned from next full month of date of start of work.

22.14 Suspension of unsafe Construction Works

(i) Upon recommendation of the Engineer-in-Charge to this effect, or on his own volition in cases of emergency or urgency, the Engineer-in-Charge may by notice require the Contractor to suspend forthwith the whole or any part of the Works if, in the reasonable opinion of Engineer-in-Charge, as the case may be, such work threatens the safety of the Users and or other persons on or about the Project. Provided, however, that in case of an emergency, the Engineer-in-Charge may suomoto issue the notice referred to hereinabove.

(ii) The Contractor shall, pursuant to the notice under above para, suspend the Works or any part thereof for such time and in such manner as may be specified by the Engineer-in-Charge and thereupon carry out remedial measures to secure the safety of suspended works, the Users, other persons and vehicles on or about the Project. The Contractor by notice require the Engineer-in-Charge to inspect such remedial measures forthwith and request for revocation of suspension. Upon reviewing the remedial measures, the Engineer-in-Charge shall either revoke such suspension or instruct the Contractor to carry out such other and further remedial measures as may be necessary and reasonable and the procedure set forth in this Clause shall be repeated until the suspension hereunder is revoked.

(iii) Subject to other provisions of the agreement, all reasonable cost incurred for maintaining and protecting the Works or part thereof during the period of suspension (the “Preservation Costs”) shall be borne by the contractor, if in the opinion of Engineer-in-Charge suspension is on account of reasons attributable to the contractor.

(iv) If suspension of Work is for reasons not attributable to the Contractor, the Engineer-in-Charge shall determine any Time Extension, if required, in accordance with the provisions of clause-5.

22.15 Online maintenance of Site records including testing records.

(i) The Engineer-in-Charge may require the contractor to upload all the site records in any online system devised by him. The contractor shall have to ensure that all the required site records, as desired by the Engineer-in-Charge shall be uploaded in this online system. Nothing extra on this account shall be payable to the contractor. In case these records are to be maintained in any online module then contractor shall comply with this.

CLAUSE 23 : CHANGES IN FIRM'S CONSTITUTION TO BE INTIMATED

Where the contractor is a partnership firm/company/LLP, the prior approval in writing of the Engineer-in-charge shall be obtained before any change is made in the constitution of the firm/ company/ LLP. Where the contractor is an individual or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said clause 21.

CLAUSE 24

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25 : SETTLEMENT OF DISPUTES & ARBITRATION

25.1 Settlement of Disputes

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

I. If the Contractor considers any work demanded of him to be outside the requirements of the Contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in connection with or arising out of the Contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request Engineer-in-Charge in writing for written instruction or decision. Thereupon, the Engineer-in-Charge shall give his written instructions or decision within a period of one month from the receipt of the Contractor's letter.

II. In case the Contractor is not satisfied with the decision of Engineer-in-Charge, he may proceed for arbitration as detailed in Clause 25.2 hereinafter.

III. It is a term of Contract that each party invoking arbitration must exhaust the aforesaid mechanism of settlement of claims/disputes prior to invoking arbitration.

IV. Performance of this Agreement/ Contract shall continue during arbitration proceedings or any other dispute resolution mechanism pursuant to Clause 25.2. No payment due or payable by the Employer shall be withheld on account of pending reference to the arbitration or other dispute resolution mechanism excepts to the extent that such payment of dispute.

25.2 Arbitration

Any dispute, controversy of claims arising out of or relating to this Agreement or the breach, termination or invalidity thereof, shall be settled through following mechanism:

a. Firstly, the aggrieved party shall write a letter to the other party detailing its grievances and calling upon the other party to amicably resolve the dispute by convening a joint meeting. Accordingly, the parties as per their convenience shall jointly convene the said meeting(s), wherein minutes of the said meeting(s) shall be prepared and countersigned by all the parties. It is mandatory to prepare minutes of meeting(s) and to be countersigned by all the parties, irrespective of the outcome of the said meeting(s).

b. In the event the parties are unable to reach on any settlement in the said meeting(s), then the aggrieved party shall mandatorily resort to pre-litigation mediation mechanism with Delhi High Court Mediation Cell, New Delhi.

c. It is only upon failure of the pre-litigation mediation mechanism with Delhi High Court Mediation Cell, then the aggrieved party shall resort to resolution of disputes through arbitration of a Sole Arbitrator. The appointing authority of Sole Arbitrator is CMD, WAPCOS Limited, to which neither of the parties have any objection nor they shall ever object.

d. Subject to the parties agreeing otherwise, the Arbitration proceedings shall be conducted in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 (amended as on date).

e. It is also acknowledged and accepted that the Employer is only working as intermediary between the Contractor/Supplier and the Principal Employer/Owner, thus in the event, any dispute arises under the present agreement and referred to Arbitration for adjudication, then subject to corresponding clause in the Contract between Principal Employer/Owner & the Employer, Principal Employer/Owner shall also be made party to the said Arbitration proceedings. Also, the award including costs if any passed against the Employer and costs incurred in the proceedings shall be the sole responsibility of Principal Employer/Owner. The said clause if found inapplicable, even then the other terms of the Arbitration Clause shall survive and shall be acted upon.

f. The place/seat of arbitration shall be Delhi and any award whether interim or final, shall be made, and shall be deemed for all purposes between the parties to be made, in Delhi. The arbitral procedure shall be conducted in English language and any award or awards shall be rendered in English. The procedural law of the arbitration shall be Indian Law. The award of the arbitrator shall be final and conclusive and binding upon the Parties.

g. The Contract and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the laws of India and the Parties submit to sole & exclusive jurisdiction of courts at Delhi."

25.3 English Language

The request for arbitration, the answer to the request, the terms of reference, any written submissions, any orders and awards shall be in English and, if oral hearings take place, English shall be the language to be used in the hearings.

25.4 Performance during Arbitration

Pending the submission of and/or decision on a Dispute and until the arbitral award is published, the Parties shall continue to perform their respective obligations under the Contract without prejudice to a final adjustment in accordance with such award.

25.5 No arbitration for decision on sub-standard work

The decision of Engineer-in-Charge regarding the quantum or reduction as well as justification thereof in respect of payment for sub-standard work which may be decided to be accepted will be final and would not be open to arbitration.

CLAUSE 26 : CONTRACTOR INDEMNIFY WAPCOS AGAINST PATENT RIGHTS

The contractor shall fully indemnify and keep indemnified the WAPCOS against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against WAPCOS in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the WAPCOS if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27 : WITHHOLDING AND LIEN IN RESPECT OF SUM DUE FROM CONTRACTOR

(i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-charge or the Government shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-charge or the Government shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the Government shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge or with the Government or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Government will be kept withheld or retained as such by the Engineer-in-Charge or Government till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) by the competent court, as the case may be and that the contractor will

have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-charge or the Government shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.

(ii) Government / WAPCOS shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Government to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by Government to the contractor, without any interest thereon whatsoever.

Provided that the Government shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the Superintending Engineer or Executive Engineer on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Superintending Engineer or the Engineer-in-Charge.

CLAUSE 28 : LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-incharge or the Government or any other contracting person or persons through Engineer-incharge against any claim of the Engineer-in-charge or Government or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer- in-charge or the Government or with such other person or persons. It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-charge or the Government will be kept withheld or retained as such by the Engineer-in-charge or the Government or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor

CLAUSE 29: EMPLOYMENT OF COAL MINING OR CONTROLLED AREA LABOUR NOT PERMISSIBLE

The contractor shall not employ coal mining or controlled area labour falling under any category whatsoever on or in connection with the work or recruit labour from area within a radius of 32 km (20 miles) of the controlled area. Subject as above the contractor shall employ imported labour only i.e., deposit imported labour or labour imported by contractors from area, from which import is permitted.

Where ceiling price for imported labour has been fixed by State or Regional Labour Committees not more than that ceiling price shall be paid to the labour by the contractor.

The contractor shall immediately remove any labourer who may be pointed out by the Engineer-in-Charge as being a coal mining or controlled area labourer. Failure to do so shall render the contractor liable to pay to WAPCOS a sum calculated at the rate of Rs.10/- per day per labourer. The certificate of the Engineer-in-Charge about the number of coal mining or controlled area labourer and the number of days for which they worked shall be final and binding upon all parties to this contract.

It is declared and agreed between the parties that the aforesaid stipulation in this clause is one in which the public are interested within the meaning of the exception in Section 74 of Indian Contract Act, 1872.

Explanation:- Controlled Area means the following areas:

Districts of Dhanbad, Hazaribagh, Jamtara – a Sub-Division under Santhal Pargana Commissionery, Districts of Bankuara, Birbhum, Burdwan, District of Bilaspur.

Any other area which may be declared a Controlled Area by or with the approval of the Central Government.

CLAUSE 30 : WATER FOR WORKS

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.

CLAUSE 31 : ALTERNATE WATER ARRANGEMENTS

The contractor shall be allowed to construct temporary wells in Government land for taking water for construction purposes only after he has got permission of the Engineer-in- charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.

CLAUSE 32 : EMPLOYMENT OF TECHNICAL STAFF AND EMPLOYEES

Contractors Superintendence, Supervision, Technical Staff & Employees

(i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

As per tendered amount (worked out on the basis of quoted rate of individual items)and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical

representative(s) who will be supervising the work. Minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Special Conditions of Contract. Even of the contractor (or partner(s) in case of firm/ company)is himself / herself an Engineers, it is necessary on the part of the contractor to Employ principal technical representative / technical representative (s) as per stipulation in Special Conditions of Contract.

The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-incharge and shall be available at site before start of work.

All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s) The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording /checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative(s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements/checked measurements/ test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as specified in Special Conditions of Contract and the decision of the Engineer-In-Charge as recorded in the site order book and measurement recorded checked/test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/areappointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Engineers employed by him) along with every on account bill/ final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

(ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-inCharge and the persons so removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 33 : LEVY/TAXES PAYABLE BY CONTRACTOR

i. GST, Building and other Construction Workers Welfare Cess or any other tax, levy or Cess in respect of input for or output by this contract shall be payable by the contractor and Government shall not entertain any claim whatsoever in this respect except as provided under Clause 34.

ii. The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.

iii. If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the Government of India and does not any time become payable by the contractor to the State Government, Local authorities in respect of any material used by the contractor in the works, then in such a case, it shall be lawful to the Government of India and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor

CLAUSE 34 : CONDITIONS FOR REIMBURSEMENT OF LEVY/TAXES IF LEVIED AFTER RECEIPT OF TENDERS

(i) All tendered cost shall be inclusive of all taxes and levies (except GST) payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the WAPCOS attributable to delay in execution of work within the control of the contractor.

However, effect of variation in rates of GST or Building and Other Construction Workers Welfare Cess or imposition or repeal of any other tax, levy or cess applicable on output of the works contract shall be adjusted on either side, increase or decrease.

Provided further that for Building and Other Construction Workers Welfare Cess or any tax (other than GST), levy or cess varied or imposed after the last date of receipt of tender including extension if any, any increase shall be reimbursed to the contractor only if the contractor necessarily and properly pays such increased amount of taxes/levies/cess.

Provided further that such increase including GST shall not be made in the extended period of contract for which the contractor alone is responsible for delay as determined by WAPCOS for extension of time.

(ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Government and/or the Engineer-in-Charge and shall also furnish such other information/document as the Engineer-in-Charge may require from time to time.

(iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, or variation or repeal of such tax or levy or cess give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 35 : TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR

Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Engineer-In-Charge on behalf of the WAPCOS shall have the option of terminating the contract without compensation to the contractor.

CLAUSE 36 : IF RELATIVE WORKING IN WAPCOS THEN THE CONTRACTOR NOT ALLOWED TO TENDER

The contractor shall not be permitted to tender for works in the WAPCOS responsible for award and execution of contracts in which his near relative is posted as an officer in any capacity. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to Officer in WAPCOS. Any breach of this condition by the contractor would render him liable to be debarred from tendering in WAPCOS for any breach of this condition.

NOTE: By the term “near relatives” is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE 37 : NO GAZETTED ENGINEER TO WORK AS CONTRACTOR WITHIN ONE YEAR OF RETIREMENT

No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of India shall work as a contractor or employee of a contractor for a period of one year after his retirement from government service without the previous permission of Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor’s service, as the case may be.

CLAUSE 38 : THEORETICAL CONSUMPTION OF MATERIAL

(i) After completion of the work and also at any intermediate stage in the event of non-reconciliation of materials issued, theoretical quantity of materials used in the work shall be calculated on the basis and method given hereunder:

(a) Quantity of cement & bitumen shall be calculated on the basis of quantity of cement & bitumen required for different items of work as shown in the Schedule of Rates mentioned

in Special Conditions of Contract. In case any item is executed for which standard constants for the consumption of cement or bitumen are not available in the above mentioned schedule/statement or cannot be derived from the same shall be calculated on the basis of standard formula to be laid down by the Engineer-in-Charge.

(b) Theoretical quantity of steel reinforcement or structural steel sections shall be taken as the quantity required as per design or as authorized by Engineer-in-Charge, including authorized lappages, chairs etc. plus 3% wastage due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter wise, section wise and category wise separately.

(c) Theoretical quantity of G.I. & C.I. or other pipes, conduits, wires and cables, pig lead and G.I./M.S. sheets shall be taken as quantity actually required and measured plus 5% for wastage due to cutting into pieces (except in the case of G.I./M.S. sheets it shall be 10%), such determination & comparison being made diameter wise & category wise.

(d) For any other material as per actual requirements.

Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Special Conditions of Contract. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorized variation, if not returned by the contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within fifteen days of the issue of written notice by the Engineer-in-charge

(ii) The said action under this clause is without prejudice to the right of the WAPCOS to take action against the contractor under any other conditions of contract for not doing the work according to the prescribed specifications.

CLAUSE 39 : COMPENSATION DURING WARLIKE SITUATION

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation upto the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-In-Charge upto Rs. 5,000/- and by the WAPCOS for a higher amount. The contractor shall be paid for the damages/destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity

of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work. In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-In-Charge.

CLAUSE 40 : APPRENTICES ACT PROVISIONS TO BE COMPLIED WITH

The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and the WAPCOS may, in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

CLAUSE 41 : RELEASE OF SECURITY DEPOSIT AFTER LABOUR CLEARANCE

The Security Deposit of the work shall be refunded if no labour complaint has been received from the labour officer till the due date of its payment. Lf a labour complaint is received during this period, the Engineer-in-Charge shall, after issue of notice in this regard to the contractor, deduct the amount required to settle the complaint from his security deposit and refund the balance amount..

CLAUSE42: INSURANCE

1. **Requirements**

   Before commencing execution of works, unless stated otherwise in the special conditions of contract, it shall be obligatory for the contractor to obtain at his own cost stipulated insurance cover under the following requirements:

   a) Contractor's all risk and Third Party Cover.
   b) Liability under the workmen's compensation Act, 1923, Minimum Wages Act, 1948 and Contract Labour (Regulation and Abolition) Act, 1970.
   c) Accidents to staff, Engineers, Supervisors and others who are not governed by workmen's compensation Act.
   d) Damage to material, machinery and works due to fire theft etc.
   e) Any other risk to be covered by insurance as may be specified by the employer in the special conditions of contract.

2. **Policy in Joint Names of Contractor and Employer**

   The policy referred to under sub-clause 46(1) above shall be obtained in the joint names of the contractor and the employer and shall inter-alia provide coverage against the following, arising out of or in connection with execution of works, their maintenance and performance of the contract.

   a) Loss of life or injury involving public, employee of the contractor, or that of employer and Engineer, labour etc.
   b) Injury, loss or damage to the works or property belonging to public, government bodies, local authorities, utility organizations, contractors, employer or others.

3. **Currency of Policy**

   The policies shall remain in force throughout the period of execution of the works and till the

expiry of the defect liability period. The contractor shall, whenever called upon, produce to the engineer or his representative the various insurance policies obtained by him as also the rates of premia and the premia paid by him to ensure that the polices indeed continue to be in force. If the contractor fails to effect or keep in force or provide adequate cover in the insurance policies mentioned in the sub clause 46(1) or any other insurance he might be required to effect under the contract, then in such cases, the employer may effect and keep in force any such insurance or further insurance and the cost and expenses incurred by him in this regard shall be deductible from payments due to the contractor or from the contractor's performance security.

CLAUSE 43: CONDITIONS SPECIFIC TO GREEN BUILDINGS PRACTICESCLAUSE

The contractor shall strictly adhere to the following conditions as part of his contractual obligations:

1. SITE

1.1 The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction phase. The contractor shall implement the Erosion and Sedimentation Control Plan (ESCP) provided to him by the Engineer-in-charge as part of the larger Construction Management Plan (CMP). The contractor shall obtain the Erosion and Sedimentation Control Plan (ESCP) Guidelines from the Engineer-in-charge and then prepare "working plan" for the following month's activities as a CAD drawing showing the construction management, staging & ESCP. At no time soil should be allowed to erode away from the site and sediments should be trapped where necessary.

1.2 The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The contractors shall take the clearance of the architects / Engineer-in-charge before any excavation. Top soil should be stripped to a depth of 20 cm (centimetres) from the areas to be disturbed, for example proposed area for buildings, roads, paved areas, external services and area required for construction activities etc. It shall be stockpiled to a maximum height of 40 cm in designated areas, covered or 369tilize369369o with temporary seeding for erosion prevention and shall be reapplied to site during plantation of the proposed vegetation. Top soil shall be separated from subsoil, debris and stones larger than 50 mm (369tilize369369o) diameter. The stored top soil may be used as finished grade for planting areas.

1.3 The contractor shall carry out the recommendations of the soil test report for improving the soil under the guidance of the Engineer-in-charge who would also advise on the timing of application of fertilizers and warn about excessive nutrient levels.

1.4 The contactor shall carry out post-construction placement of topsoil or other suitable plant material over disturbed lands to provide suitable soil medium for vegetative growth. Prior to spreading the topsoil, the sub-grade shall be loosened to a depth of 50mm to permit bonding. Topsoil shall be spread uniformly at a minimum compacted depth of 50mm on grade 1:3 or steeper slopes, a minimum depth of 100mm on shallower slopes. A depth of 300mm is preferred on relatively flatter land.

1.5 The Contractor should follow the construction plan as proposed by the Engineer-in-charge to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site. Protect top soil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc.

1.6 No excavated earth shall be removed from the campus unless suggested otherwise by Engineer-in-charge. All subsoil shall be reused in backfilling/landscape, etc as per the instructions of the Engineer-in-charge

1.7 The contractor shall not change the natural gradient of the ground unless specifically instructed by the architects / landscape consultant. This shall cover all natural features like water bodies, drainage gullies, slopes, mounds, depressions, rocky outcrops, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-charge.

1.8 The contractor shall not carry out any work which results in the blockage of natural drainage.

1.9 The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge

1.10 Contractor shall reduce pollution and land development impacts from automobiles use during construction.

1.11 Overloading of trucks is unlawful and creates and erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.

2. CONSTRUCTION PHASE AND WORKER FACILITIES

2.1 The contractor shall specify and limit construction activity in preplanned/ designated areas and shall start construction work after securing the approval for the same from the Engineer-in-charge. This shall include areas of construction, storage of materials, and material and personnel movement.

2.2 Preserve and Protect Landscape during Construction

a) The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

b) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.

c) The contractor shall conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) proposed by the Engineer-in-charge. All the existing trees should be preserved, if not possible than compensate the loss by re-planting trees in the proportion of 1:3.

d) The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.

e) The contractor shall ensure that maintenance activities shall be performed as needed to ensure that the vegetation remains healthy. The preserved vegetated area shall be inspected by the Engineer-in-charge at regular intervals so that they remain undisturbed. The date of inspection, type of maintenance or restorative action followed shall be recorded in the logbook.

2.3 Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. A project-vide policy of “Nothing leaves the Site” should be followed. In such a case when strictly followed, care would automatically be taken in ordering and timing of materials such that excess doesn’t become “waste”. The Contractor’s ingenuity is especially called towards meeting this prerequisite/ credit (GRIHA). Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.

2.4 Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

2.5 The contractor shall provide clean drinking water for all workers

2.6 The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employs in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

2.7 The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall ensure the following activities to prevent air pollution during construction:

- Clear vegetation only from areas where work will start right away
- Vegetate / mulch areas where vehicles do not ply.
- Apply gravel / landscaping rock to the areas where mulching / paving is impractical
- Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 – 20%
- Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done

with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged. Water spraying can be done on:

a) Any dusty materials before transferring, loading and unloading

b) Area where demolition work is being carried out

c) Any un-paved main haul road

d) Areas where excavation or earth moving activities are to be carried out

- The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.
- All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.
- Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas
- Provide hoardings of not less than 3m high along the site boundary, next to a road or other public area
- Provide dust screens, sheeting or netting to scaffold along the perimeter of the building Cover stockpiles of dusty material with impervious sheeting
- Cover dusty load on vehicles by impervious sheeting before they leave the site

2.8 Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminium can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program.

2.9 The contractor shall ensure that no construction leach ate (Ex: cement slurry), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including, reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).

2.10 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

2.11 The contractor shall Comply with the safety procedures, norms and guidelines (as applicable) as outlined in the document Part 7 _Constructional practices and safety, 2005, National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

2.12 The contractor shall ensure the following activities for construction workers safety, among other measures:

- Guarding all parts of dangerous machinery.
- Precautionary signs for working on machinery
- Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.
- Durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- Ensuring that walking surfaces or boards at height are of sound construction and are provided with safety rails or belts.
- Provide protective equipment; helmets etc.
- Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.
- Provide sufficient and suitable light for working during night time.

2.13 Adopt additional best practices, prescribed norms in construction industry.

2.14 The storage of material shall be as per standard good practices as specified in Part 7, Section 2 – Storage, Stacking and Handling practices, NBC 2005 and shall be to the satisfaction of the Engineer-in-charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipments with proper access and proper manoeuvrability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipments at different stages of construction shall be considered. The Owner shall not take any responsibility on any account.

2.15 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper 373tilize373373on of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English.

2.16 The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

2.17 Contractor shall collect the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials for structural use like TMT steel rolled with high percentage of recycled steel, and RMC mix with fly-ash etc. (see appendix)

2.18 Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, agrifiber, linoleum, wheat board, strawboard and cork.

2.19 Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect the system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.

2.20 The contractor shall ensure that a flush out of all internal spaces is conducted prior to andover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

2.21 Contractor shall make efforts to reduce the quantity of indoor air contaminants that are dorous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below:
Paints
Non-flat – 150 g/L
Flat (Mat) – 50 g/L
Anti corrosive/ anti rust – 250 g/L
Coatings
Clear wood finishes
Varnish – 350 g/L
Lacquer – 550 g/L
Floor coatings – 100 g/L
Stains – 250 g/L
Sealers
Waterproofing sealer – 250 g/L
Sanding sealer – 275 g/L
Other sealers – 200 g/L
The VOC (Volatile Organic Compounds) content of adhesives and sealants used must be less than VOC content limits mentioned:

Architectural Applications VOC Limit(g/l less water)
Indoor Carpet adhesives – 50
Carpet Pad Adhesives – 50
Wood Flooring Adhesive – 100
Rubber Floor Adhesives – 60
Sub Floor Adhesives – 50
Ceramic Tile Adhesives – 65
VCT and Asphalt Tile adhesives – 50
Dry Wall and Panel Adhesives – 50
Structural Glazing Adhesives – 100
Multipurpose Construction Adhesives – 70
Substrate Specific Application VOC Limit (g/l less water)
Metal to Metal – 30
Plastic Foams – 50
Porous material (except wood) – 50
Wood – 30
Fiber Glass – 80

2.22 Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with GRIHA program standards and guidelines. Towards meeting the aforementioned building environmental rating standard(s) expert assistance shall be provided to him up on request.

2.23 **Water Use during Construction**

Contractor should spray curing water on concrete structure and shall not allow free flow of water. After liberal curing on the first day, all the verticals surfaces of concrete structures should be painted with curing chemical to save water nothing extra shall be paid. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water ponding on all sunken slabs using cement and sand mortar.

2.24 The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and nonservice able (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

2.25 MATERIALS & FIXTURES FOR THE PROJECT

2.26 The contractor shall 375tilize375 to source most of the materials for construction at this project within a distance of 800 km radius from the project site. Contractor shall collect the relevant material certificates to prove the same

h) Any material that is to be sourced from outside the prescribed radius shall be done after securing the necessary approval from the Engineer-in-charge.

i) All cement used at site for reinforced concrete, precast members, mortar, plaster, building blocks, etc shall be PPC (Ordinary Portland Cement). The PPC must meet the requirements of IS 1489: 1991. (Minimum 25% replacement of cement with fly ash in PPC (Portland Pozzolona Cement) by weight of the cement used in the overall RC for meeting the equivalent strength requirements).

j) As a measure to reduce wastage and water consumption during construction, the contractor shall source or set up the infrastructure for a small scale ready mix concrete, all concreting works at site shall 375tilize only batch mix concrete.

k) The contractor has to comply as per MoEF issued notification 8.0.763I dated 14th Sept.1999 containing directive for greater fly ash utilization, where it stipulates that ii. Every construction agency engaged in the construction of buildings within a radius of 50 km radius of a Thermal Power Plant, have to use of 100% fly ash based bricks/blocks in their construction. Any brick/block containing more than 25% fly ash is designated as fly ash brick/block. As per GRIHA credits, bricks / blocks should contain more than 40% fly ash.

l) The contractor shall ensure that sand from approved source is used in place of sand in an all concreting works unless specifically instructed otherwise by the Engineer-in-charge.

m) Timber and aluminum use should be minimized in the project. If used, timber shall constitute of reclaimed timber and aluminum shall constitute recycled content. The source of such reclaimed timber shall be approved by the Engineer-in-charge.

n) The contractor shall ensure that nontoxic anti-termite and other pest control is strictly used.

o) The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer-in-charge before the application of any such material.

p) All plumbing and sanitary fixtures installed shall be as per the requirement of the of the GRIHA and shall adhere to the minimum LPM and LPF mentioned.

q) The contractor shall employ 100% zero ODP (ozone depletion potential) insulation; HCFC hydro-chlorofluorocarbon)/ and CFC (chlorofluorocarbon) free HVAC and refrigeration equipment's and/halon-free fire suppression and fire extinguishing systems.

r) The contractor shall ensure that all composite wood products/agro-fibre products used for cabinet work, etc do not contain any added urea formaldehyde resin.

2.28 **CONSTRUCTION WASTE**

a) Contractor shall ensure that wastage of construction material is kept to a maximum of 3%.

b) All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Employ measures to segregate the waste on site into inert, chemical, or hazardous wastes.

c) All construction debris shall be used for road preparation, back filling, etc, as per the instructions of the Engineer-in-charge, with necessary activities of sorting, crushing, etc.

d) No construction debris shall be taken away from the site, without the prior approval of the Engineer-in-charge.

e) The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos

f) If and when construction debris is taken out of the site, after prior permissions from the Project Manager, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

g) Inert waste to be disposed off by Municipal Corporation/ local bodies at landfill sites.

2.29 **Documentation**

a) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer-in-charge on a monthly basis:
   (i) Water consumption in litres
   (ii) Electricity consumption in 'kwh' units
   (iii) Diesel consumption in litres
   (iv) Quantum of waste generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.
   (v) Digital photo documentation to demonstrate compliance of safety guidelines as specified here.

b) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer-in-charge on a weekly basis:
   i) Quantities of material brought into the site, including the material issued to the contractor.
   ii) Quantities of construction debris (if at all) taken out of the site
   iii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication and block making works, etc as guided by the Engineer-in-charge.

c) The contractor shall submit one document after construction of the buildings, a brief description along with photographic records to show that other areas have not been

disrupted during construction. The document should also include brief explanation and photographic records to show erosion and sedimentation control measures adopted. (Document CAD drawing showing site plan details of existing vegetation, existing buildings, existing slopes and site drainage pattern, staging and spill prevention measures, erosion and sedimentation control measures and measures adopted for top soil preservation during construction

d) The contractor shall submit to the Engineer-in-charge after construction of the buildings, a detailed as built quantification of the following:
   i) Total materials used,
   ii) Total top soil stacked and total reused
   iii) Total earth excavated,
   iv) Total waste generated,
   v) Total waste reused,
   vi) Total water used,
   vii) Total electricity, and
   viii) Total diesel consumed.

e) The contractor shall submit to the Engineer-in-charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which top soil has to be gathered, designate area where it will be stored, measures adopted for top soil preservation and indicate areas where it will be reapplied after construction is complete.

f) The contractor shall submit to the Engineer-in-charge, a detailed narrative (not more than 250 words) on provision for safe drinking water and sanitation facility for construction workers and site personnel.

g) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in reinforced concrete.

h) Provide supporting document from the manufacturer of the pre-cast building blocks specifying the fly ash content of the blocks used in an infill wall system.

i) The contractor shall, at the end of construction of the buildings, submit to the Engineer-in-charge, submit following information, for all material brought to site for construction purposes, including manufacturer's certifications, verifying information, and test data, where Specifications sections require data relating to environmental issues including but not limited to: Source of products: Supplier details and location of the supplier and brand name.

j) Project Recyclability: Submit information to assist Owner and WAPCOS in recycling materials involved in shipping, handling, and delivery, and for temporary materials necessary for installation of products.

k) Recycled Content: Submit information regarding product post industrial recycled and post consumer recycled content. Use the "Recycled Content Certification Form", to be provided by the Commissioning Authority appointed for the Project.

l) Product Recyclability: Submit information regarding product and product's component's recyclability including potential sources accepting recyclable materials.

m) Clean tech: Provide pollution clearance certificates from all manufacturers of material

o) Indoor Air quality and Environmental Issues: Submit following certificates:

   a) Certifications from manufacturers of Low VOC paints, adhesives, sealant and polishes used at this particular project site.

b) Certification from manufacturers of composite wood products/agro fibre products on the absence of added urea formaldehyde resin in the products supplied to them to this particular site.

c) Submit environmental and pollution clearance certificates for all diesel generators installed as part of this project.

p) Provide total support to the Engineer-in-charge appointed by the WAPCOS in completing all Green Building Rating related formalities, including signing of forms, providing signed letters in the contractor's letterhead.

2.30 **EQUIPMENT**

a) To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval and as per the specifications of the architects.

b) All lighting installed by the contractor around the site and at the labour quarters during construction shall be CFL/LED bulbs of the appropriate illumination levels. This condition is a must, unless specifically prescribed.

The contractor is expected to go through all other conditions of the GRIHA rating stipulations, which can be provided to him by the architects.

Failure to adhere to any of the above mentioned items, without necessary clearances from the architects and the Engineer-in-charge, shall be deemed as a violation of contract and the contractor shall be held liable for penalty as determined by the architects.

CLAUSE 44: PAYMENT

1. Payment Schedule

The Payment Schedule includes a schedule setting out each Milestone Event to be achieved in a month for the Works.

2. Contractor's Application for Payment

From the date of issue of the Notice to Proceed, on the 5th (fifth) Business Day of any month, the Contractor may submit a Request for Payment, to WAPCOS Limited Representative in respect of the preceding month.

Within each Request for Payment the Contractor shall show separately:

(i) the amounts which the Contractor claims to be payable as the cost of the Works completed during that month; and

(ii) the cumulative amount of all prior payments made by WAPCOS Limited; and

(iii) any amounts to which the Contractor considers are due and payable to it in accordance with the provisions of the Contract.

The Contractor's Request for Payment shall:

(i) be prepared on forms in the form and in a number advised by WAPCOS Limited Representative; and

(ii) contain confirmation of the relevant Milestone Events which, in the opinion of the Contractor have been achieved in that month which applies to each such Milestone Event; and

(iii) be accompanied by:

(a) Copy of relevant records of measurement of works, jointly taken and signed by both the parties;

(b) A status report describing in such detail as may reasonably request, the percentage of any uncompleted Milestone Event for the month in question and the work to be undertaken by the Contractor prior to the next Request for Payment;

(c) Certification by WAPCOS Limited Representative confirming that the Milestone Events referred to in the Request for Payment have been achieved.

(d) Confirmation by the Contractor of any amounts due and owing from the Contractor to WAPCOS Limited pursuant to the Contract;

(e) The Contractor's certification that the quality of all completed Works accords with the requirements of the Contract;

(f) The Contractor's certification that each obligation, item of cost or expense mentioned in that Request for Payment has not been the basis of any previous payment.

(g) The Contractor's certification that it has reviewed all financial and budget data contained in the Request for Payment;

(h) The Contractor's certification that the quality of all completed Works accords with the requirements of the Contract;

(i) The Contractor's certification that each obligation, item of cost or expense mentioned in that Request for Payment has not been the basis of any previous payment; and

(j) The Contractor's certification that each Subcontractor who performed part of the Works which was included in the immediately preceding Certificates of Payment was paid all amounts then due to it for such Works

(k) The Contractor providing evidence of the validity of the Contractor's Insurances.

CLAUSE 45: PREFERENCE TO MAKE IN INDIA

- The provisions of revised 'Public Procurement (Preference to Make in India) Order 2017 Revision' issued by Department of Industrial Policy and Promotion under Ministry of Commerce and Industry vide letter no.-P45021/2/2017-PP (BE-II) as amended on 16.09.2020 shall be applicable to the bidding process and award of the contract shall be done accordingly. In this connection, the minimum local content shall be 50% and the margin of purchase preference shall be 20%.
- **Verification of Local Content**

  The bidder at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement of the tender. They shall also give details of the location(s) at with the local value addition is made.

  In cases of procurement for a value in excess of Rs 10 Crores, the bidder shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

CLAUSE 46: RULE 144 (xi) IN GENERAL FINANCIAL RULES (GFRs) 2017

i) Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.

ii) "Bidder "(including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

iii) "Bidder from a country which shares a land border with India" for the purpose of this Order means:-

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

iv) The beneficial owner for the purpose of 1.4.2.(iii) above will be as under:

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

   a. "Controlling ownership interest" means ownership of or entitlement to more than twenty- five per cent. Of shares or capital or profits of the company;
   b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone of together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profit of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the

trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

v) An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

vi) The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

CLAUSE 47: BLACKLISTING POLICY

The Blacklisting Policy of the company is available on official website of WAPCOS Limited. The Bidder/tenderer/consultant/contractors have to mandatorily furnish an undertaking addressing the same to Engineer-in-Charge in the form of certificate to abide the contents of Blacklisting Policy as per FORM-C. Any action in violation of the blacklisting policy or to the certificate furnished shall result in cancellation of tender at the stage before or after the award of work.

SECTION– IV

SPECIAL CONDITIONS OF CONTRACT

SECTION–IV

SPECIAL CONDITIONS OF CONTRACT

1.0 SPECIAL CONDITIONS OF CONTRACT

The Special Condition of Contract (SCC) shall be followed by the Contractor in addition to the General Condition of Contract (GCC) of tender document. The following General Condition of Contract of this tender are modified/added as detailed below. In case of any discrepancy between GCC and SCC, the SCC will succeed over GCC.

Clause No.	Description	Applicability/Modified/ Added
GENERAL RULES AND DIRECTIONS		
1	EPC Mode	EPC Mode I
1	Type of Buldings	Permanent
4	Applicable for Item Rate EPC Tender	Not Applicable
8	Applicable for Item Rate EPC Tender	Not Applicable
DEFINITIONS		
Added	Principal Employer/ Owner/Client means Sashastra Seema Bal (SSB), Ministry of Home Affairs,Govt. of India	
2(ii)	Site / Location Means **As Mentioned in NIT**	
2(iv)	Work / Project Means: **As Mentioned in NIT**	
2 (v & vi)	Engineer-In-Charge & Accepting Authority Will be intimated to the successful Bidder at the time of issue of Notice to Proceed the works.	
2 (ix)	Market Rate Percentage on cost of materials and labour to cover all overheads and profits	15%
2(x)	Standard Schedule of Rates for works	Delhi Schedule Rates- 2023
2(xv)	Date of Commencement of work	15 days after date of award of Work
CLAUSES OF CONTRACT		
Clause 1	Performance Guarantee	**Applicable** a) Within 21 (Twenty One) days of receipt of the Letter of Award, but not later than the date of the signing of the Agreement, the successful Bidder shall deliver to the Employer a Performance Security in any of the forms given below for an amount equivalent to 5% of the Contract price: • a Bank Guarantee issued by a Scheduled Commercial Bank approved by Reserve Bank of India (RBI) as per Annexure-I of Bid document; or

Clause No.	Description	Applicability/Modified/ Added
		• a deposit receipt of a Scheduled Commercial Bank approved by Reserve Bank of India (RBI) in favour of WAPCOS Limited payable at Delhi/ Gurgaon. b) The confirmation of the Bank Guarantee shall be sought from the issuing bank through Structured Financial Messaging System (SFMS), from our banker Indian Overseas Bank, NHB, Gurgram, Branch Code: 1935, IFSC code: IOBA0001935 and Beneficiary as WAPCOS Limited. This shall also be applicable in respect of confirmation of any extension of the Bank Guarantee as and when required. c) The period for submission of the Performance Security can be extended by the competent authority upon written request received from the Bidder stating the reason for delays in procuring the Performance Security to the satisfaction of the Competent Authority. d) Failure of the successful Bidder to comply with the requirements of performance security shall constitute sufficient grounds for cancellation of the award. e) The Performance Security shall be valid till recording successful Completion of Defect Liability Period. The performance guarantee shall be returned to the Contractor without any interest after completion of Defect Liability Period.
Clause 1A	Security Deposit	Applicable 5% of Tendered Value
	Release of security Deposit	After 1 (one) year of Successful Completion of Defect Liability period without any interest.

<table>
<tr><th>Clause No.</th><th>Description</th><th>Applicability/Modified/ Added</th></tr>
<tr><td>Clause 2</td><td>Compensation for Delay / Liquidity Damage</td><td>Applicable
0.50% of the cost of Contract price per week. (Maximum up to 10% of the Contract price).
Milestones to be Achieved:
<table>
<tr><th>SN.</th><th>Description of Mile stone (Physical)</th><th>Time allowed (from the date of start)</th><th>Amount to be withheld on failure to achieve milestone</th></tr>
<tr><td>1</td><td>1/8th of whole of the work</td><td>3 Months</td><td>10% of 1/8th of the value of work done</td></tr>
<tr><td>2</td><td>3/8th of whole of the work</td><td>9 months</td><td>10% of 3/8th of the value of work done</td></tr>
<tr><td>3</td><td>¾th of whole of the work</td><td>18 months</td><td>10% of ¾th of the value of work done</td></tr>
<tr><td>4</td><td>Whole of the work</td><td>24 months</td><td>10% of the value of work done or Completion cost whichever is higher.</td></tr>
</table>

Upon non-achievement of milestone in the allowed time, the amount equivelent to 10% of the work done shall be withheld from the subsequent RA Bills.
In case of achievement of next Milestone, the withhold amount shall be released
In case of faliure to the achievement of milestone, the withheld amount shall be converted to Compensation for delay (LD), if the delays attributable to the Contractor
</td></tr>
<tr><td>Clause 2A</td><td>Incentive for Early Completion</td><td>Not Applicable</td></tr>
<tr><td rowspan="2">Clause 5</td><td>Commencement of work</td><td>15 days from date of award</td></tr>
<tr><td>Stipulated time of completion of project</td><td>As Mentioned in NIT</td></tr>
<tr><td>Clause 7</td><td>Payment on Intermediate Certificate to be regarded as advance</td><td>Applicable</td></tr>
</table>

Clause No.	Description	Applicability/Modified/ Added
Clause 7A	No Running Account Bill shall be paid for the work till the applicable labour licenses …….	Applicable
New Clause 7B (Added)	Payment	The Bidder (Contractor) acknowledges that under the present Tender and Work Order/ Contract Agreement (if work is awarded to bidder), WAPCOS is only working as intermediary between SSB being Principal Employer. Thus the bidder unconditionally acknowledges that the payments under the present Tender and Work Order/ Contract Agreement (if work is awarded to bidder) shall be made proportionately by WAPCOS only on back to back basis i.e., after 45 days subject to receipt of payment from SSB being Principal Employer. The Bidder also unconditionally agree that in the event the, payment or part thereof, under the present Tender and Work Order/ Contract Agreement (if work is awarded to bidder) is not received from SSB, then WAPCOS &/or any of its Employee/ Officer shall not be responsible to pay any amount to Bidder. The said condition shall supersede any and all other conditions of Tender and Work Order/ Contract Agreement between the parties (if work is awarded to bidder). All payments shall be released by way of e-transfer through RTGS in India directly at their Bank account by WAPCOS
Clause 10 B(i)	Secured Advance on Non-Perishable Materials	Applicable 75% of the assessed value of material. Secured Advance shall be recovered as per the consumption of material for which secured advance was given to the contractor by the deducting from the contractors bills.
Clause 10 B(ii)	Mobilization Advance	10% of the tendered value on submission of Advance Bank Guarantee from Scheduled commercial Bank for the amount equal to 110% of the amount of advance and valid for the contract period. The simple interest at the rate of 10 percent per annum shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Note: Above 10% Mobilization Advance shall be paid in two instalments. The first instalment of 5% of tendered value shall be paid on commencement of the work at site. The second instalment of 5% of tendered value shall be paid after achieving the financial progress of 10 (ten) percent of the contract

Clause No.	Description	Applicability/Modified/ Added
		price.
Clause 10C	Payment on Account of Increase In Price / Wages due to Statutory Order	Not Applicable
Clause 10CA	Payment due to Variation In Prices of Materials after Receipt of Tender	Not Applicable
Clause 10CC	Payment Due to Increase/ Decrease in Prices/Wages (Excluding Materals Covered Under Clause 10 CA) after receipt of tender for works	Not Applicable
Clause 25	Settlement of Disputes and Arbitration	**Modified as:** Any dispute, controversy or claims arising out of or relating to this Contract Agreement (Agreement that will be signed between WAPCOS and Bidder, if work is awarded to bidder), or the breach termination or invalidity thereof shall be settled through following mechanism: a) Firstly, the aggrieved party shall write a letter to the other party detailing its grievances and calling upon the other party to amicably resolve the dispute by convening a joint meeting. Accordingly, the parties as per their convenience shall jointly convene the said meeting(s), wherein minutes of the said meeting(s) shall be prepared and countersigned by all the parties it is mandatory to prepare minutes of meeting(s) and to be countersigned by all the parties, irrespective of the outcome of the said meeting(s). b) In the event the parties are unable to reach on any settlement in the said meeting(s), then the aggrieved party shall mandatory resort to pre-litigation mediation mechanism with Delhi High Court Mediation Cell, New Delhi. c) It is only upon failure of the pre-litigation mediation mechanism with Delhi High Court Mediation Cell then the aggrieved party shall resort to resolution of disputes through arbitration of a Sole Arbitrator. The appointing authority of Sole Arbitrator is CMD, WAPCOS Limited, to which neither of the parties have any objection nor they shall ever object. d) Subject to the parties agreeing otherwise, the Arbitration proceedings shall be conducted in accordance with the provisions of the Indian

Clause No.	Description	Applicability/Modified/ Added
		Arbitration and Conciliation Act, 1996 (amended as on date). e) It is also acknowledged and accepted that WAPCOS is only working as Intermediary between the Bidder (Contractor) and SSB being Principal Employer, thus in the event, any dispute arises under the Contract Agreement (Agreement that will be signed, if work is awarded to bidder) and referred to Arbitration for adjudication, then subject to corresponding clause in the Memorandum of Agreement between SSB and WAPCOS, SSB shall also be made party to the said Arbitration proceedings. Also, the award including costs if any passed against WAPCOS and costs incurred in the proceedings shall be the sole responsibility of SSB. The said clause if found inapplicable, even then the other terms of the Arbitration Clause shall survive and shall be acted upon. f) The place/seat of arbitration shall be Delhi and any award whether interim or final, shall be made, and shall be deemed for all purposes between the parties to be made, in Delhi. The arbitral procedure shall be conducted in English language and any award or awards shall be rendered in English. The procedural law of the arbitration shall be Indian Law. The award of the arbitrator shall be final and conclusive and binding upon the Parties. g) The Contract and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the laws of India and the Parties submit to sole & exclusive jurisdiction of courts at Delhi."
New Clause-1	Minimum Amount of Running Account Bill	The Contractor shall periodically submit Running Account (RA) bills for the gross work done not be less than Rs 2.00 Cr. for Construction. All running bills shall be accompanied with the Geo-tagged (GPS) clear photographs in sufficient number and angles illustrating the progress of work and for which claims raised in RA bill. The photographs shall be duly signed by the Contractor. The contractor shall submit the bill in the standard format agreed by the SSB/ WAPCOS

2.0 ADDITIONAL CONDITIONS OF CONTRACT

Clause 1: General:

The following Additional Conditions of Contract shall be read in conjunction with General Conditions of Contract. The same shall be considered as an extension and not limitation of the obligations of the Contractors. In case of any discrepancy between Additional Conditions of Contract and the General Conditions of Contract, these Additional Conditions of Contract shall take precedence over the General Conditions of Contract.

Clause 2: Setting out Base Lines and Levels

The Contractor shall establish at site the layout of the building/road etc. for the work from base lines and grids established by the Employer and shall be responsible for all measurements in connection therewith. The Contractor shall, at his own expenses, furnish all stakes, templates, platform, equipment, ranges and labour that may be required in setting out or laying out any part of the work. The Contractor shall be held responsible for the proper execution of the work to such lines, levels and grids as may be established or indicated on the drawings and specifications. The Contractor shall check the bench marks and stakes existing at the site for laying out lines and levels.

The Contractor has to construct and maintain proper bench marks at all salient locations/positions in order that the lines and levels may be accurately checked at all times.

Theodolite/ Total Station, Levels, Prismatic Compass, Chain, Steel and FRP Tapes and all other surveying instruments found necessary on the works shall be provided by the Contractor for use at site in connection with this work.

Clause 3: Employer's and Contractor's Risks

i. The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

ii. The Employer is responsible for the excepted risks which are in so far as they directly affect the execution of the Works in India, the risks of acts of God, war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

iii. All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks as defined in Clause 3(ii) of this section are the responsibility of the Contractor.

iv. Contractor shall take full responsibility for the adequacy, stability and safety of all site operations and methods of construction during the entire period of construction

Clause 4.0 Insurance of Works Etc.

4.1 Contractor is required to take Contractor's All Risk policy from Nationalized insurance company in the joint name with Employer and bear all costs towards the same for the full period of execution of works including the Defect Liability Period for the full amount of contract against all loss of damage from whatever cause arising other than excepted risks for which he is responsible under the terms of the contract and in such manner that the Employer and the Contractor are covered during the period of construction of works and/or also covered during the period of Defect Liability for loss or damage.

a. The Works and the Temporary works to the full value of such works.

b. The materials, constructional plant, centering, shuttering and scaffolding materials and other things brought to the site for their full value.

Whenever required by Employer, the Contractor shall produce the policy or the policies of insurance and the receipts for payment of the current premium.

4.2 Insurance under Workmen Compensation Act

Contractor is required to take insurance cover under the Workman Compensation Act, 1923 amended from time to time from Nationalized insurance company and pay premium charges thereof. Wherever required by Employer the Contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

4.3 Third Party Insurance

Contractor is required to take third party insurance cover for an amount of 5% (five percent) of contract value from Nationalized insurance company for insurance against any damage, injury or loss which may occur to any person or property including that of Employer / Owner, arising out of the execution of the Works or Temporary works. Wherever required by Employer the Contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

4.4 If the Contractor shall fail to effect and keep in force the insurances referred to above, or any other insurance which he may be required to effect under the terms of the Contract, then and in any such case the Employer on advice of the EIC may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Employer as aforesaid from any moneys due or which may become due to the Contractor, or recover the same as debt due from the Contractor.

4.5 The Contractor shall at all times indemnify Employer and Owner against all claims, damages or compensation under the provision of Payment of wages act-1936, Minimum Wages Act-1948, Employer's liability Act-1938, the workmen's compensation Act-1947, Industrial Disputes Act-1947 and Maternity Benefit Act-1961 or any modifications thereof or any other law in force or as consequence of any accident or injury to any workman or other persons in or about the works, whether in the employment of the Contractor or not, against all costs, charges and expenses of any suit, action or proceedings arising out of such incident or injury and against all sum or sums which may with the consent of the Contractor be paid to compromise or compound any such claim. Without limiting his obligations and liabilities as above provided, the Contractor shall insure against all claims, damages or compensation payable under the Workmen's Compensation Act 1923 or any modification thereof or any other law relating thereto.

4.6 The Contractor, in case of re-building or reinstatement after fire, shall be entitled to such extension of time for completion as the EIC may deem fit, but shall, however not be entitled to reimbursement by the Employer or any shortfall or deficiency in the amount finally paid by the Insurer in settlement of any claim arising as set out herein.

Clause 5: Approval by the Engineer-in-Charge

5.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer-in-Charge, who is to approve them if they comply with the Specifications

and Drawings.

5.2 The Contractor shall be responsible for design of Temporary Works.

5.3 The Engineer-in-Charge's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

Clause 6: Possession of the Site:

The Employer shall give possession of relevant parts of the Site to the Contractor within 7 days from the date of commencement of work to enable to commence and proceed with the Works in accordance with the programme of Clause – **5 of GCC**. If possession of a part is not given by the time stated, the work programme will be rescheduled based on the delay of possession of site and extension of time considered accordingly. However, no payment/compensation will be given to Contractor for such extension.

Further, if and to the extent that the delay of possession of site caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time and any payment.

Clause 7: Access to the Site & Instructions

i) The Contractor shall allow the Employer and any person authorized by the Employer access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being stored/manufactured/ fabricated / assembled for the works.

ii) The Contractor shall carry out all instructions of the Engineer-in-Charge pertaining to works, which comply with the applicable laws where the Site is located.

iii) The Contractor shall permit the Engineer-in-Charge to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Engineer-in-Charge, if so, required by the Employer.

Clause 8: Management Meetings

8.1 Either the Engineer-in-Charge or the Contractor may require the other to attend a management meeting.

8.2 The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

8.3 The Engineer-in-Charge shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken is to be decided by the Engineer-in-Charge either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

Clause 9: Co-operation & Co-ordination with other Agencies:

The Contractor shall have to make Coordination with other agencies engaged at the site by the Employer at no extra cost and share the Site with other Contractors/agencies, public authorities, utilities working in the area, if any. The Contractor will carry out the entire work in a planned manner by coordinating his work with other agencies, who will be simultaneously carrying out work in the same area and also co-ordinate in connection with the position of various fixtures, inserts, embedment's and other allied work connected with the completion of the building / subject work.

In case of any dispute between the agencies engaged on the same work, decision of Engineer-in-Charge shall be final and binding.

Clause 10: Approach Roads and Transportation of Equipment & Materials

Contractor will be permitted to use the existing roads in the establishment area for the purpose of transporting equipment and materials and for use of labour etc. The Engineer-in-Charge, however, will not undertake to provide any approach roads to the actual site of work. It shall be the entire responsibility of the Contractor to provide and maintain such temporary approach roads including cross drainage works if any at his own cost for the purpose of movement of men, materials and equipment. Layout of such approach roads shall be submitted to Engineer-in-Charge for his approval before undertaking the construction of the same. Such approach roads shall be made available to other agencies for carrying out the work in the same area in consultation with the Engineer-in-Charge of the works without any cost.

Clause 11: Operations and Storage Areas

All operations of the Contractor shall be confined to areas authorized by the Engineer-in-Charge and storage of materials shall be over the areas specially indicated by the Engineer-in-Charge. Materials like sand and metal of different sizes shall be stored in properly constructed bins with hard floor to avoid inter mixing as well as mixing with objectionable materials. The Contractor shall be obliged to keep the premises in hygienic conditions by proper drainages of the area provided with suitable approaches throughout the period of Contract. He shall rectify all damages caused to the Government property within the areas thus allotted. He shall be responsible to clear all rank, vegetation at site at his own cost.

Clause 12: Contractor's Storage and Site Office

The Contractor shall make own arrangement for storing his equipment, plant, materials etc. and for his site office and cement godown. The Contractor be solely responsible for watching or guarding his property and materials. Contractor shall cover all materials at site with requisite insurance against theft, larceny, dacoits, fire tempest and flood. The Contractor, however, shall have to dismantle the shed and vacate the land after the receipt of due notice from the Engineer-in-Charge if the same is obstructing any work. The Contractor should obtain necessary permission / approval from Statutory Authorities such as Municipal corporations / Local bodies etc. for construction of temporary structures at site of work such as cement godown, stores, site office etc. It will be responsibility of the Contractor to prepare proper plans, to pay any requisite fees to statutory authorities and to execute the work for the temporary structure at their own cost as per the conditions and rules laid by statutory authorities.

Clause 13: Temporary Buildings

Any temporarily buildings and office facilities as required by the Contractor shall be arranged by the Contractor at his own expense. Area for the same will be made available by the Employer, if available. Prior approval of the Engineer-in-Charge shall be obtained in respect of location and layout and details of those buildings. After the work is over, all these temporary facilities shall be removed by the Contractor at his own expense to the satisfaction of the Engineer-in-Charge within 10 days from the date of completion.

Labour Camp is permitted at site. However, no labour shall be permitted to stay in the partly completed building at any time. Unauthorized occupation of any area/partly completed building by the Contractor's labourer will be treated as trespass and action will be taken to evict them including termination of Contract if deemed fit. Sanitary as well as water supply and drainage facilities as

required by the labour laws in force, are to be provided by the Contractors at his own cost. The labour camp should be dismantled by the Contractor before handing over the buildings.

Clause 14: Traffic Interference & Inconvenience to the Public

The Contractor shall so conduct his operations as to interfere as little as possible with the traffic/public. When interference to traffic is inevitable, a notice of such interference shall be given to the Engineer-in-Charge well in advance (at least 2 days) at any stage, if it becomes necessary to divert the traffic, the Contractor shall obtain permission from the local traffic authorities at his own expense. T he Employer will render reasonable assistance in the matter. The Contractor shall take all precautionary and other measure, such as providing warning signals, temporary diversion etc. all as directed by the Engineer-in-Charge.

The Contractor shall not deposit materials anywhere at work site which will seriously inconvenience the public. The Engineer-in-Charge may require the Contractor to remove any materials which are considered to be a danger or inconvenience to the public or cause them to be removed at the Contractor's cost.

The Contractor shall exercise full care to ensure that no damage is caused by him or his workmen, during the operation to the existing water supply and power lines. The cost of any such damage and risks arising out of this shall be entirely borne by the Contractor.

Clause 15: Drainage around the Buildings and Foundation for other Works

The Contractor shall be entirely responsible for the provision and maintenance of efficient drainage arrangements in the work site to lead all water whatsoever pumped out from the excavations on account of rains, floods, springs or any other source whatsoever. The foundation trenches shall be kept free from water while all the works below ground level are in progress.

Flooding or ponding of water in the work site shall not be permitted under any circumstances whatsoever and the Contractor shall take all necessary precautions to prevent the same by providing suitable pumps and other dewatering arrangement.

The cost of repairing damages if any, to the work under execution or to any government property in and around the site shall be entirely borne by the Contractor where such damages are due to his non-compliance with the above conditions.

Clause 16: Samples for Materials

Samples of all materials to be incorporated in the work shall be submitted to the Engineer-in-Charge for his approval without any extra cost. The approved samples will be kept with Engineer-in-Charge till completion of the work. Materials not conforming strictly to the approved samples will be rejected.

Samples of various materials required for testing shall be provided free of charge by the Contractors. Testing charges if any, including all other expenses required to be incurred for taking the samples, conveyance, packing etc., shall be borne by the Contractors.

In addition to submission of samples of materials, the Contractor shall make a sample mock up ready in all respects, including the finishing items of works of civil works including installation of fittings as well as those of water supply, plumbing and sanitation work and electrical, internal fittings, fixtures and wiring etc. to determine the acceptable standard of materials and workmanship. The sample mock up with all final finishes and installations etc. shall be got approved from the Engineer-in-Charge in advance before taking up the finishing items of the work in the building(s). Each of these

samples of items of work / trade / materials approved by the Engineer-in-Charge will be endorsed as "Guide line samples", as per which further works shall be executed in strict conformity with standard of materials & workmanship.

The provision of co-ordination and co-operation with other agencies shall be mutatis- mutandis applicable to the above mentioned "Sample mock-up / Sample finishing works" also.

Testing charges shall be borne by the Contractor. If any additional test needs to be at site, Contractor shall bear the cost.

Clause 17: Execution of Work and Inspection

The work shall be conducted under the general direction of the Engineer-in-Charge and is subject to inspection by his appointed representative to ensure strict compliance with the terms of the Contract and shall at all times be open and accessible to the inspection and supervision of Engineer-in-Charge. No failure of the Engineer-in-Charge or his designated representative during the progress of the work to discover or to reject materials, or work not in accordance with the requirement of this Contract shall be deemed as on acceptance thereof or a waiver of defects therein and no payment by the Engineer-in-Charge or partial or entire occupancy of the premises shall be construed to be an acceptance of work or materials which are not strictly in accordance with the requirements of the Contract. No changes whatsoever to any provision of specifications shall be made without authorization from the Engineer-in-Charge. If any work has been executed with unsound, imperfect, or unskillful workmanship shall be removed / replaced/ reconstructed by the Contractor at no extra cost.

Clause 18: Supply of Water for Construction Purpose

Contractor shall make his own arrangement of water required for the work, at his own cost, subject to the approval of the Engineer-in-Charge. However, the Contractor will be permitted to drill bore well/s at site and the Contractor shall pay all charges to local bodies / authorities / royalty if any and obtain statutory approvals, geological survey provide pump, pipeline, casing with all accessories required for functioning of the bore well. The water should be tested in an approved laboratory and should be permitted to use in work if found suitable for construction. However, Contractor shall make alternate arrangements in case the water is not found fit for construction. After completion of work the Contractor will handover complete bore well/s with pump/s and accessories to the Employer at no cost.

The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of Contractor(s) if the arrangements made by the Contractor(s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

The Contractor shall arrange to provide a minimum storage of 5000 Liters. (Or two days requirement whichever is higher) of water at building location with all necessary pumps for storage of water shall be built by the Contractor at his own cost at location to be approved by the Engineer-in-Charge. The water storage tanks should be leak proof and wastage and misuse of water is strictly prohibited, Contamination and pollution of water to be strictly avoided. Construction water should not be used for drinking or for domestic purpose. Contractor will make his own arrangement for water required for drinking purposes at site of work at his own cost.

Clause 19: Supply of Electricity for Construction Purpose

The Contractor shall make his own arrangement for the same as required at his own cost. Required authorization letter will be issued by Employer.

Clause 20: Construction and Maintenance by the Contractor

As mentioned above, the Contractor shall maintain his entire electrical installation, appliances etc. in good and safe condition as required under relevant rules and BIS codes of practice etc. However, the following precautions and directives shall be followed in addition to observing other essential rules:

a. The minimum clearance (measured at the lowest sag point) to be maintained for all overhead lines shall be 4 Mtrs. Cross country or along roads and 6.1 metres across roads.

b. Metallic poles as a general rule should be avoided and if used should be earthed individually.

c. All loose hanging of wires and cables should be avoided. The line wires should be properly supported and an approved method of fixing shall be adopted.

d. Installation shall not cause any hindrance to the normal movement of men and materials at site.

e. All cables and wires should be adequately protected against mechanical damage during construction activity of all Contractors, working at site.

f. In case the cable is required to be laid in ground, it should be adequately protected by covering the same with bricks, R.C.C. tiles or any other approved means and cable markers provided at suitable intervals as per approval of the Engineer-in-Charge.

g. Laying of cable and wires direct on floor shall not be allowed but if absolutely necessary for some very short lengths, the same shall be taken through suitable mechanical covering like G.I. / M.S. Pipes etc.

h. All the cut door switch boards, equipment etc., should be adequately protected against rain or preferably they should not be exposed to weather.

i. If overhead lines using bare conductors are installed, a guard wire system of adequate size shall run along the cables / wires and earthed effectively.

j. The connection for portable machines shall be taken only through suitably rated 3 pin socket points. Iron clad industrial type outlets are preferred. While taking supply through socket outlet a plug top must be used, avoiding inserting of loose wires in the sockets. The third pin of the plug shall invariably be earthed and 3 core wire of appropriate specifications and capacity shall be used.

k. All three-phase equipment shall be provided with duplicate earthing. All metallicframes, light fixtures, portable equipment's etc. should be effectively earthed to main earthing.

l. Duly authorized persons having valid wireman's license / competence certificate must be employed under the supervision of a qualified and experienced Electrical Supervisor for carrying out electrical work and repair of electrical equipment, installation and maintenance etc. at site.

m. Special precaution shall be taken by the Contractor not to disturb the sapling/trees recently planted by the side of the compound wall. The sapling/trees fall within the

building/road etc. shall be transplanted to suitable place with written approval of the Engineer-in-Charge and maintained by the Contractor till completion of works at his own cost.

Clause 21: Stores and Materials at Site

Stores and materials required for the works are to be deposited by the Contractor only in places to be indicated by the Engineer-in-Charge. The Engineer-in-Charge shall have a right at any time to inspect and examine any stores and materials intended to be used in or on the works either on the site or at any factory or workshops or other places where such stores or materials are being constructed or manufactured or processed or any place from where they are being obtained and the Contractor shall give such facilities as required to be given for such inspection and examination.

The Engineer-in-Charge shall be entitled to have tests made without any extra cost to the Employer at the laboratory selected by the Employer for any stores and or materials supplied by the Contractors, who shall provide at his own expense all the facilities which the Engineer-in-Charge may require for this purpose.

Any stores and materials brought to site for use on the work and which has been rejected by Engineer-in-Charge shall be immediately removed off the site by Contractor at his own expenses and intimate in writing accordingly to the Engineer-in-Charge. The rejected materials shall not be used in any manner in the construction of the project.

Clause 22: Proper drawings and instructions

The Contractor shall provide shop drawings and other drawings to the Engineer-in-Charge in line with the requirement of contract agreement from time to time for approval for the purpose of proper and adequate execution and maintenance of the work and the Contractor shall carry out the work and be bound by the same.

Copies of the drawings approved by the Engineer-in-Charge and the construction drawings issued shall be kept by the Contractor at the site and the same shall at all reasonable times be made available for inspection and use by the Engineer-in-Charge and any other person authorized by the Engineer-in-Charge.

Clause 23: Employment of Staff for Plumbing & Electrical Works

- **Employment of certified plumber:** Certified plumbers should be employed by the Contractor on the work for main sewer, filtered and unfiltered main.
- **Employment of licensed electrical foreman:** The Contractor should employ a licensed electrical foreman to supervise the Electrical works.

Clause 24: Urgent repairs

If by reason of any accident or failure or other event occurring to or in connection with the work or any part thereof either during the period of construction or maintenance, any remedial or other work or repair shall in the opinion of the Engineer-in-Charge be urgently necessary for security etc. and the Contractor is unable or unwilling, at once, to do such work or repair, the Engineer-in-Charge may be his own or other workmen do such work or repair as he may consider necessary. If the work or repair so done which in the opinion of the Engineer-in-Charge, the Contractor was liable to do at his own expenses under the Contract and all cost and charges properly incurred by the Engineer-in-Charge in so doing shall on demand be paid by the Contractor or may be deducted from any sum due or which may become due to the Contractor provided always that the Engineer-

in-Charge shall soon after the occurrence of any such emergency as may be reasonable, practicable, notify the Contractor thereof in writing.

Clause 24A: Cost of Repairs

Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions including the situation as stipulated at Clause 24 of this Section.

Clause 25: Security Regulations

The Contractor has to strictly follow the security regulations at the work site regarding entry of personnel, material etc. and any other regulation that might be enforced from time to time.

All materials and articles brought by the Contractor to the work site shall have to be declared at the security gate. Similarly, no materials shall be taken out from the premises without proper gate pass.

The Contractors, Suppliers, vendors, workers engaged in work/business will be issued with renewable entry permit to avoid unauthorized entry in the work site on scrutiny of applications in prescribed form.

For working on Sundays, Holidays and late hours, even though permission will be accorded by the Engineer-in-Charge, the Contractor will have to make application to the Engineer-in-Charge also and keep them informed well in advance.

The area where the proposed work is to be carried is residential / non-residential area under the control of Security authorities, entry to the site of work shall be through the main gate only. The Contractor shall follow strictly the security regulations at site of work regarding entry of personnel, materials etc. and other regulations that might be enforced from time to time at the work site and also in the campus for smooth and efficient operation. The Contractors, his agents, representatives, workmen etc. and his materials, carts, trucks or other means of transport etc. will be allowed to enter through and leave from such point of entry/exit at such times, the authorities in charge of the area, at their sole discretion, may permit.

The Contractors, his agents and representatives are required to be in possession of the individual identity / muster cards or passes. The muster cards or passes are examined by the security staff at the time entry / exit inside the premises and also at any time or number of times within such area.

The Contractor will have to apply for entry/muster permits of likely number of labour to be engaged during the week for the workers and authorize their representatives to collect the entry permits for labour from the Employer's Security Authorities.

It will be the responsibility of the Contractor to maintain the list of laborers permitted to work inside the premises in a register and the representative of Contractor's labour will have to issue entry pass to each labour after making necessary entry in the registers.

The Contractor, his agents, representatives, workmen shall strictly observe the orders pertaining to prevailing fire precautions.

In addition to the above, other security regulations as may be imposed by the Security authorities / Engineer-in-Charge shall be complied with / observed by the Contractor and his workmen, in addition to the above.

Any breach of above security regulations and rules in force from time to time will be viewed seriously. No claim whatsoever will be entertained by the Employer on account of the observation of the Security regulations.

Clause 26: Watch and Ward and Lighting

The Contractor shall in connection with the works provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary or as required by the Engineer-in-Charge and duly constituted authority for the protection of the workers or for safety and convenience of the public or others. The Contractor shall be responsible for all damages and accidents caused due to negligence in this regard.

It will be the entire responsibility of the Contractor to protect the work(s) carried out by them including the fittings, fixtures and other accessories provided by them till the entire work is satisfactorily handed over to the Employer.

Clause 27: Third Party Inspection of Works

Notwithstanding the any other conditions of Contract, the principal Employer / Employer shall get the work inspected by any third party (IIT/ NIT as appointed by SSB / WAPCOS) during the progress of work or any time after the construction and development of project up to the defect liability period. The Contractor, his consultant, subcontractors of all tiers and suppliers thereof shall make available during the inspection with all records necessary to demonstrate that the Works have been executed in accordance with the Contract Agreement.

The Contractor shall also be responsible for consequential effects arising out during the inspection done by the third party from time to time and will take appropriate action for rectification of defective work. Rectification of defective works or replacement of sub-standard materials or articles, as pointed out by the third party authorized by Employer, will be carried out or replaced by the Contractor at his own risk and cost. The Employer will not pay any extra amount for such rectification or replacement.

Clause 28: Other Conditions

1. The Contractor shall deploy the resources at site to start the construction after written approval from Employer. No claim shall be entertained for idle of labour, idle machinery, idle technical / non-technical staff, idle T&P if any, due to delay in start of the works. If any dispute/ hindrance may arise during construction due to any reason whatsoever, the Contractor is not liable for any financial claim or damages due to such circumstances.
2. The efforts will be made by the employer to handover the site to the Contractor free of encumbrances. However, in case of any delay in handing over of the site to the Contractor, the employer shall only consider suitable extension of time for the execution of the work. It should be clearly understood that the employer shall not consider any revision in contract price or any other compensation whatsoever viz. towards idleness of Contractor’s labour, equipment etc.
3. The Contractor shall be responsible for removal of all over-ground and under-ground structures (permanent, semi-permanent and temporary) and constructions from the site. The cost to be incurred in this regard shall be deemed to be included in the quoted rate of Bill of Quantities items and contractor shall not be entitled for any extra payment whatsoever, in this regard. The contractor, if required, shall demolish old structures on the proposed site, properly. The useful material obtained from demolition of structures &

services shall be the property of the owner/Employer and these materials shall be stacked in workmanship like at the place specified by the Engineer- in-charge.

4. All mass Reinforced Cement Concrete work shall be design mix concrete of specified grade and initial design mix shall be carried out from the Govt. approved Laboratory/NABL accredited lab/ NIT/IIT immediately after award of work. The Design Mix report shall be submitted to WAPCOS before commencement of the RCC works at site.

5. The Contractor shall submit the Standard Operating Procedure (SOP) / Quality Control & Quality Assurance Plan as finalized and submit to the WAPCOS & Third Party Quality Assurance Agency (TPQAA) for checking & verification during visit of TPQAA. The reports of TPQAA will be the part of the Running Account Bills which will be raised after completion of important milestones / critical activities as defined.

6. If required, the contractor has to do site clearance, enabling work, barricading, diversion of Roads, shifting/ realignment of existing utility services, drains, nallahs etc. at his own cost as per direction of Engineer-in-charge and the contractor shall not be entitled for any extra payment whatsoever in this regard.

7. Necessary arrangements including its maintenance are to be made by the contractor for temporary diversion of flow of existing drain and road, as the case may be. The existing drain, road would be demolished, wherever required, with the progress of work under the scope of proposed project. The existing Road and Drain, which are not in the alignment of the said project but are affected and/ or need to be demolished during execution for smooth progress of the project, shall be rehabilitated to its original status and condition (including black topping) by the contractor at his own cost. The cost to be incurred by contractor in these regards shall be deemed to be included in the quoted rates of the Bill of Quantities items and contractor shall not be entitled for any extra payment whatsoever, in these regards.

8. The Contractor shall be responsible to co-ordinate with service provider/concerned authorities for cutting of trees, shifting of utilities and removal of encroachments etc. and making the site un-encumbered from the project construction area required for completion of work. This shall include initial and frequent follow up meetings/ actions/ discussions with each involved service provider/ concerned authorities. The contractor shall not be entitled for any additional compensation for delay in cutting of trees, shifting of utilities and removal of encroachments by the service provider/ concerned authorities.

9. The information about the public utilities (whether over ground or underground) like electrical/ telephone/ water supply lines, OFC Cables, open drain etc. is the responsibility of contractor to ascertain the utilities that are to be affected by the works through the site investigation and collection of information from the concerned utility. The Contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, etc. nothing extra shall be payable to the agency on this account.

10. Contractor shall provide R.O. Plant sufficient for workers employed at site, his technical staff and site staff.

11. The Contractor shall make his own arrangements for obtaining electric connection and water Connection/arrangement (if required). The water charges and electricity charges as charged by the Owner and Local Authorities shall be borne by the Contractor. No dispute in this regard shall be entertained.

12. The Contractor shall dispose of all the dismantled materials, debris, garbage, waste outside of the campus of the works at his own cost and provide clear and clean site at the time of handing over the works

13. The Contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignment, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the Contractor at his own cost to the instructions and satisfaction of the Engineer-in-Charge.

14. The cost/rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark, spot levels, construction of all safety and protection devices, barriers, earth embankments, preparatory works, all testing of materials working during monsoon, working at all depths, height and locations etc. unless specified in the schedule of quantities.

15. The contractor shall deposit royalty and obtain necessary permit for supply of bajri, stone, kankar, sand etc. from the local authorities and quoted rates shall be inclusive of royalty on any account whatsoever.

16. Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been in-built in the items and nothing extra shall be payable (or) extra cement considered in consumption on this account.

17. Samples of various materials required for testing shall be provided free of charges by the Contractor. Testing charges, if any, unless otherwise provided shall be borne by the Contractor. All other expenditure required to be incurred for taking the samples, conveyance, packing etc. shall be borne by the Contractor himself.

18. The Contractor shall have to make approaches road to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-Charge. Nothing extra shall be paid on this account.

19. No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The Contractor shall be fully responsible for any damage to the govt. property and work for which the payment has been advanced to him under the contract and he shall make good the same at his risk and cost. The Contractor shall be fully responsible for safety and security of his material, T&P, Machinery brought to the site by him.

20. Wherever work is specified to be done or material procured through specialized agencies, their names shall be got approved well in advance from Engineer-in-Charge. Failure to do so shall not justify delay in execution of work. It is suggested that immediately after award of work, Contractor should negotiate with concerned specialist agencies and send their names for approval to Engineer-in-Charge. Any material procured without prior approval of Engineer-in-Charge in writing is liable to be rejected. Engineer-in-Charge reserves right to get the materials tested in laboratories of his choice before final acceptance. Nonstandard materials shall not be accepted.

21. The construction joints shall be provided in predetermined locations only as decided by Engineer-in-Charge. The cost of shuttering for these construction joints shall be included in item of Concrete work / RCC work and nothing extra shall be payable on this account to the Contractor.

22. No chase cutting/dismantling of plaster/RCC/CC shall be allowed, so Contractor has to execute the electrical work accordingly.

23. The Contractor shall invariably prepare the samples of finishing items i.e. flooring of different types, external & internal finishing i/c colour scheme of paint, tiles in dado, flooring in platforms & staircase, water supply & sanitary fittings and any other item as per direction of Engineer-in-Charge. The Contractor shall proceed with further finishing items only after getting the samples of these items approved in writing from Engineer-in-Charge. No extra claim whatsoever beyond the payments due at agreement rates will be entertained from the Contractor on this account.

24. **Special Conditions for Steel**: The Contractor shall procure TMT bars of Fe500D grade from primary steel producers as per the list of approved makes.

25. **Special Conditions for Waterproofing**: The contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-Charge in writing, for water proofing treatment for lower ground floor, underground tank, pump room and on roofs. Guarantee in the prescribed proforma attached with tender document shall be given by the specialized firm, for a period of ten years from the date after the maintenance period prescribed in the contract, which shall be counter signed by the contractor as token of overall responsibility. If however any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of intimation. In case it is not attended to, the same will be got done by another agency at the risk and cost of the contractor. This guarantee deposit can however be released in full if a bank guarantee of equivalent amount for 10 years is produced and deposited with the Employer.

26. **Use of Fly Ash Bricks**: The contractor is required to use fly ash clay bricks conforming to IS 3812, in view of the Fly Ash Notification issued by the Government of India from time to time.

27. Contractor shall not divert any advance payments or part thereof for any work other than that needed for completion of the contracted work. All advance payments received as per terms of the contract (i.e., mobilization advance, secured advance against materials brought at site, secured advance against plant & machinery and/or for work done during interim stages, etc.) are required to be re-invested in the contracted work to ensure advance availability of resources in terms of materials, labour, plant & machinery needed for required pace of progress for timely completion of work.

28. The Contractor shall be responsible for consequential effects arising out during the inspection done by the Chief Technical Examiner Cell, Central Vigilance Commission or Committee constituted by the WAPCOS or construction site visiting team of WAPCOS or by the Building Works Committee or third party authorized by WAPCOS or any Statuary Committee or by any duly authorized representative of WAPCOS, during the progress or any time after the construction and development of project up to the defect liability period, and will take appropriate action for rectification of defective work and modifications as suggested by the above teams/ group/ individual. Rectification of defective works or replacement of sub-standard materials or articles or modifications, as pointed out by the Chief Technical Cell, Central Vigilance Commission, committee constituted by WAPCOS, construction site visiting team, Building Works Committee or authorized representative of WAPCOS or third party authorized by WAPCOS or any Statuary Committee, will be carried out or replaced/ modified by the Contractor at his own risk and cost.

29. Any Circular/Guidelines/SOP issued by the WAPCOS during the progress/ execution of the construction work shall be followed by the contractor without any dispute.

30. If any official of contractor is not following the directions of WAPCOS in the best interest of

work in that case, WAPCOS has full authority to get replaced that official from site of work with prior notice.

31. Handing Over of the Project: Contractor will hand over the project to Owner /Client after successful completion of each component of the project along with submission of all the required documents i.e. As- built drawings, Inventory list, guarantee / warranty bonds, certificates & invoices of equipment, lock and key of each room and NoCs form various Departments with complete satisfaction and acceptance. Contractor shall provide necessary Completion Certificate/NOC from all local Government/ Statuary Authorities including Fire, Forest, Electrical, Environment, Lift, DG Set, Complete inventory list, duly signed as-build drawings, required before handing over the project to the client. The partial handing over of works components shall not be considered. Defect Liability period of Two *years will start from the date of successful completion of each component of the project and handing over with all satisfaction & acceptance along with submission of all the required documents i.e. As-built drawings, Inventory list, guarantee / warranty bonds, certificates & invoices of equipment, lock and key of each room and NoCs form various Departments .*

32. All the modifications and any additional works (basic requirement after use of premises by user) suggested by client at the time of handing over of the project and after occupancy of premises by client during Defect Liability Period must be taken up by contractor without any disputes.

33. If any dispute/ hindrance may arise during construction due to any reason whatsoever, the contractor is not liable for any financial claim or damages due to such circumstances.

34. Royalty at the prevailing rates wherever payable shall have to be paid by the contractor on the boulders, metal, shingle, sand and bajri etc. Or any other material collected by him for the work direct to revenue authorities and nothing extra shall be paid by the WAPCOS for the same.

35. The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipment shall be got calibrated in advance from laboratory, approved by the Engineer-in-Charge. Nothing extra shall be payable on this account.

36. The contractor shall comply with proper and legal orders and directions of the local or public authority or municipality and abide by their rule and regulations and pay all fees and charges which he may be liable.

37. **Removal of rejected/sub-standard materials.**

The following procedure shall be followed for the removal of rejected/sub-standard materials from the site of work:

(i) Whenever any material brought by the contractor to the site of work is rejected, entry thereof should invariably be made in the Site Order Book under the signature of the Engineer-In-Charge, giving the approximate quantity of such materials.

(ii) As soon as the material is removed, a certificate to that effect shall be recorded by the Engineer-In-Charge against the original entry, giving, the date of removal and mode of removal, i.e., whether by truck, carts, or by manual labour. If the removal is by truck, the registration number of the truck should be recorded.

(iii) When it is not possible for the Engineer-In-Charge to be present at the site of work at the time of actual removal of the rejected/sub-standard materials from the site, the

required certificate should be recorded by the Authorized Representative of WAPCOS, and the Engineer-In-Charge should countersign the certificate recorded by the Authorized Representative.

38. If the work is carried out in more than one shift or during night, no claim on this account shall be entertained. The contractor has to take permission from the police & local authorities etc. if required for work during night hours. No claim / hindrance on this account shall be considered if work is not allowed during night time. The requisite supervision shall be made available by the WAPCOS along with necessary issue of material under joint custody.

39. In case of any inconsistency between clauses, the clause favorable/ beneficiary to the project will prevail which will be decided by the owner and WAPCOS.

SECTION – VI

ANNEXURES

ANNEXURE – I	FORMAT FOR CONTRACT AGREEMENT
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ANNEXURE – XIII	CONTRACTOR'S LABOUR REGULATIONS

ANNEXURE-I

(Format for "Contract" to be signed on Non-Judicial Stamp Paper of Rs. 100 by successful bidder)

CONTRACT AGREEMENT

This Contract made on the____ day of ___ 20____between WAPCOS Limited, a Company in corporate under Indian Company's Act and having its registered office at 5th floor, Kailash Building, 26, K. G. Marg, New Delhi (hereinafter called "WAPCOS" of the one part) and (Name of Contractor Firm & Address)_____ (hereinafter called "Contractor" of the other part).

WHEREAS the WAPCOS is desirous that Work known as "_____". (Herein after referred to as "Work/ Project") under the Tender no._____ dated_____ should be executed by the Contractor AND WHEREAS by a Letter of Award No._____ dated _____ issued by WAPCOS Limited and accepted by the contractor. WAPCOS Limited has accepted a Bid submitted by the Contractor for the execution and completion of such Work AND WHEREAS the Contractor has agreed to undertake such Work and furnish a Performance Security_____(details) pursuant to Tender conditions.

NOW THIS AGREEMENT WITNESSETH as follows;

In this Contract words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
The following documents shall be deemed to form and be read and construed as part of this Contract, viz;

a) Tender Document no._____dtd._____
b) Letter of Award to Contractor by WAPCOS
c) Documents furnished by the Contractor during Bidding process
d) Corrigendum/Amendments, if any
e) Clarifications / Correspondences, if any
f) Any other documents as forming part of the contract

1. The aforesaid documents shall be taken as complementary and mutually explanatory of one another.

2. In consideration of the payment to be made by WAPCOS to the Contractor as indicated in this Contract, the Contractor hereby covenants with WAPCOS to execute and complete the Works in conformity, in all respects, with the provisions of the Contract.

3. WAPCOS hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the contract at the time and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with Laws of India on the day, month & year indicated above.

SIGNED, SEALED AND DELIVERED

For and on behalf of the WAPCOS	For and on behalf of the Contractor
NAME _____	NAME _____
Designation	Designation
in the presence of witness:	**in the presence of Witness**
1_____	1_____
2 _____	2 _____

NOTE: Contractor shall submit the Original Power of Attorney on Non-Judicial Stamp Paper for this particular Work / Project, in the name of Person who will sign the Contract with WAPCOS after award of Work.

ANNEXURE - II
FORMAT FOR LETTER OF AWARD

No. …… Date:……

M/s ……..(Name of successful Bidder)
……. (Address of successful bidder)
……
Subject: Award Letter for "……..(Name of work)"

Reference: Tender No. …….. ……

Dear Sir,

We are pleased to inform that work of "……." is awarded to your firm, in cost of Rs. ---------- excluding GST, according to submission of your technical & financial bids against referred tender for the subjected work.

Project	Awarded Cost excluding GST
……(Name of work)	Rs. ……..

1. The "Date of Commencement of Work" shall be immediately / …….days after award of work and accordingly, planning should be started for deploying manpower, resources as per Terms & Conditions of Tender document.
2. The tender document wholly accepted by you along with all related correspondences at the time of bidding shall form a part of this letter of award.
3. You are requested to submit the following as per Terms & Conditions of
   - Performance Security @5% of Tendered Value as per the form enclosed in the tender document before signing of the Agreement within 21 (Twenty One) days of the date of acceptance of the letter of award and sign the Contract Agreement.
   - Schedule Plan/ Bar chart to complete the work in stipulated time period.
   - Details of manpower to be deployed at site along with CVs
   - List of Lab Equipment required for the work for approval of Engineer-in charge.
4. The terms & conditions of the Work will be governed as mentioned in the tender document.

This letter of award is being issued to you in duplicate. You are requested to return the duplicate copy of the letter of award immediately duly signed and stamped as a token of your unequivocal acceptance and confirmation of the same.

Thanking You,

Yours faithfully,
(Name & Designation
of the Tendering Authority)

Annexure – III

(To be submitted on non-judicial stamp paper of Rs. 100)

FORMAT FOR PERFORMANCE BANK GUARANTEE

To,
The WAPCOS Limited,
76-C, Sector 18, Institutional Area
Gurugram, Haryana-122015.

In consideration of _____ (Employer's name) (hereinafter referred to as "the Employer") which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to _____ (Contractor's name & address) (hereinafter referred to as "the Contractor" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) a contract, by issue of Employer's Notification of Award No. _____ dt. _____ and the same having been unequivocally accepted by the Contractor, resulting into a contract valued at Rs. _____(Rupees _____only) for _____(name of work) (hereinafter called "the contract") and the Contractor having agreed to provide a Contract Performance Security for the faithful performance of the entire contract equivalent to Rs. _____ (Rupees _____only) (5% of the said value of the Contract to the Employer).

We, _____ (name & address of bank) (hereinafter referred to as "the Bank" which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any or, all monies payable by the Contractor to the extent of Rs. _____ (Rupees _____only) as aforesaid at any time upto _____ without any demur, reservation, contest , recourse or protest and/or without any reference to the Contractor or court. Any such demand made by the Employer on the bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantee herein contained shall continue to be enforceable till the Employer discharges this guarantee.

We the said Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said contract have been fully paid and its claims satisfied or discharged or till the Employer certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractor and accordingly discharges the guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from, time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the

matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would but for this provision, have the effect of relieving the Bank. The guarantee shall not be affected by a change in the constitution of the bank or of the employer.

The bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance, without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

We The Said Bank do hereby declare that we have absolute and unconditional power to issue this guarantee in your favour under the Memorandum and Articles of Association or such other constitutional documents of the Bank and the undersigned have full power to execute this guarantee under the Power of Attorney / Post Approval Authorization dated _____ of the bank granted to him / us by the Bank. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the powers of the bank or its officials and the guarantee shall be deemed to have been issued as if the bank and its officials have all the powers and authorization to give this guarantee on behalf of the bank.

We the said bank do hereby certify the genuineness and appropriateness of the Stamp paper and stamp value used for issuing the guarantee. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the stamp paper or its stamp value.

We the said bank do hereby declare that our payments hereunder shall be made to you , free and clear of and without and deduction, reduction on account of any reasons including any and all present and future taxes, levies, charges of withholding whatsoever imposed or collected with respect thereto.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to Rs. _____(Rupees _____ only) and it shall remain in force upto and including _____ and shall be extended from time to time for such period as may be desired by M/s WAPCOS Limited to whom this bank guarantee has been given.

Notwithstanding anything contained herein

i) Our liability under this guarantee shall not exceed Rs. _____ (Rupees_____ only);
ii) This bank guarantee shall be valid upto _____; and
iii) our liability to make payment shall arise and we are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand in terms of the guarantee on or before _____ **(indicate a date twelve month after validity of Guarantee**)

Dated this _____day of _____ at New Delhi.

Authorized Signatory of …… Bank

Signature	**Signature**
Name……..	**Name……..**
Signature Code/ S.S no. ……	**Signature Code/ S.S no. ……**

ANNEXURE-IV

(To be submitted on non-judicial stamp paper of Rs. 100)

FORMAT FOR MOBILIZATION ADVANCE PAYMENT BANK GUARANTEE

To,
The WAPCOS Limited,
76-C, Sector 18, Institutional Area
Gurugram, Haryana-122015

In consideration of WAPCOS LTD. (hereinafter referred to as "the Employer") which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to _____ (Contractor's name) with its Registered /Head Office at _____(hereinafter referred to as "the Contractor" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) a contract, by issue of Employer's Notification of Award No. _____ dt. _____ and the same having been unequivocally accepted by the Contractor, resulting into a contract valued at Rs._____ (Rupees_____only) for _____ (hereinafter called "the contract") and the Employer having agreed to make an advance payment to the Contractor for performance of the above Contract amounting to Rs. _____ (Rupees _____only) as an advance against bank guarantee to be furnished by the Contractor.

We, _____ (name & address of bank) having its Head Office at _____ (hereinafter referred to as "the Bank" which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer immediately on demand any or, all monies payable by the Contractor to the extent of Rs. _____ (Rupees _____only) as aforesaid at any time upto _____ without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the Guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Employer discharges this guarantee. We further agree that no change in the constitution of the Bank or of the Employer shall affect this guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time, to vary the advance or to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would but for this provision, have the effect of relieving the Bank.

The bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

We the Said Bank do hereby declare that we have absolute and unconditional power to issue this guarantee in your favour under the Memorandum and Articles of Association or such other constitutional documents of the Bank and the undersigned have full power to execute this guarantee under the Power of Attorney/ Post Approval Authorization dated _____ of the bank granted to him / us by the Bank. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the powers of the bank or its officials and the guarantee shall be deemed to have been issued as if the bank and its officials have all the powers and authorization to give this guarantee on behalf of the bank.

We the said bank does hereby certify the genuineness and appropriateness of the Stamp paper and stamp value used for issuing the guarantee. We the said bank does hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the stamp paper or its stamp value.

We the said bank do hereby declare that our payments hereunder shall be made to you , free and clear of and without and deduction, reduction on account of any reasons including any and all present and future taxes, levies, charges of withholding whatsoever imposed or collected with respect thereto.

Notwithstanding anything contained hereinabove our liability under this guarantee is limited to Rs._____ (Rupees _____ only) and it shall remain in force upto and including _____ and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s _____ on whose behalf this bank guarantee has been given.

Notwithstanding anything contained herein

i) Our liability under this guarantee shall not exceed Rs._____(Rupees _____only);
ii) This bank guarantee shall be valid upto _____ and
iii) our liability to make payment shall arise and we are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand in terms of the guarantee on or before _____ **(indicate a date twelve months after the validity of the guarantee).**

Dated this _____ day of _____ at……...

Authorized Signatory of …… Bank

Signature	**Signature**
Name…….	**Name……..**
Signature Code/ S.S no. ……	**Signature Code/ S.S no. ……**

ANNEXURE-V

(On non-judicial stamp paper of Rs. 100 duly attested by Notary / Magistrate)

FORMAT FOR INDENTURE FOR SECURED ADVANCES

THIS INDENTURE made the…… day of ……..20……. BETWEEN …… (hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors administrators and assigns) of the one part and the WAPCOS (hereinafter called the WAPCOS which expression shall where the context so admits or implies be deemed to include his successors in office and assigns) of the other part.

WHEREAS by an agreement dated…….. (hereinafter called the said agreement) the Contractor has agreed AND WHEREAS the Contractor has applied to the WAPCOS that he may be allowed advances on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the construction of such of the works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges) AND WHEREAS the WAPCOS has agreed to advance to the Contractor the sum of Rupees …… on the security of materials the quantities and other particulars of which are detailed in Accounts of Secured Advances attached to the Running Account Bill for the said works signed by the Contractor on ……and the WAPCOS has reserved to himself the option of making any further advance or advances on the security of other materials brought by the Contractor to the site of the said works. Now THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees ……on or before the execution of these presents paid to the Contractor by the WAPCOS (the receipt whereof the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as aforesaid the Contractor doth hereby covenant and agree with the WAPCOS and declare as follows: -

(1) That the said sum of Rupees ……..so advanced by the WAPCOS to the Contractor as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the Contractor in or towards expediting the execution of the said works and for no other purpose whatsoever.

(2) That the materials detailed in the said Account of Secured Advances which have been offered to and accepted by the WAPCOS as security are absolutely the Contractor's own property and free from encumbrances of any kind and the contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnifies the WAPCOS against all claims to any materials in respect of which an advance has been made to him as aforesaid.

(3) That the materials detailed in the said Account of Secured Advances and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the Divisional Officer ……. Division (hereinafter called the Divisional Officer) and in the term of the said agreement.

(4) That the Contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and on his own responsibility and shall at all times be open to inspection by the Divisional Officer or any officer authorised by him. In the event of the said materials or

any part thereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree than is due to reasonable use and wear thereof the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same as required by the Divisional Officer.

(5) That the said materials shall not on any account be removed from the site of the said works except with the written permission of the Divisional Officer or an officer authorised by him on that behalf.

(6) That the advances shall be repayable in full when or before the Contractor receives payment from the WAPCOS of the price payable to him for the said works under the terms and provisions of the said agreement. Provided that if any intermediate payments are made to the Contractor on account of work done than on the occasion of each such payment the WAPCOS will be at liberty to make a recovery from the Contractor's bill for such payment by deducting there from the value of the said materials then actually used in the construction and in respect of which recovery has not been made previously, the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

(7) That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the WAPCOS shall immediately on the happening of such default be repayable by the Contractor to the WAPCOS together with interest thereon at twelve per cent per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs charges, damages and expenses incurred by the WAPCOS in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the WAPCOS to repay and pay the same respectively to him accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the WAPCOS of the said sum of Rupees ……and any further sum or sums advanced as aforesaid and all costs charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and whenever the covenant for payment and repayment herein before contained shall become enforceable and the money owing shall not be paid in accordance therewith the WAPCOS may at any time thereafter adopt all or any of the following courses as he may deem best :-

(a) Size and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractor he is to pay same to the WAPCOS on demand.

b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the WAPCOS under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

(9) That except in the event of such default on the part of the Contractor as aforesaid interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been herein before expressly provided for the same shall be finally resolved as per provisions of clause 25 of the contract.

In witness whereof the said Contractor and WAPCOS by the order and under the direction of the WAPCOS have hereunto set their respective hands the day and year first above written.

SIGNED, SEALED AND DELIVERED

For and on behalf of the Contractor

NAME _____

Designation _____

in the presence of witness:

1_____

2 _____

For and on behalf of the WAPCOS

NAME_____

Designation_____

in the presence of Witness

1_____

2 _____

ANNEXURE-VI

(To be submitted on non-judicial stamp paper of Rs. 100)

FORMAT FOR BANK GUARANTEE OF EMD

To,
The WAPCOS Limited,
76-C, Sector 18, Institutional Area
Gurugram, Haryana-122015.

WHEREAS, M/s …….. having their Registered/Head Office at …….. (hereinafter called "the Bidder") has submitted his Bid dated …… for the …… [hereinafter called "the Bid"] to M/s WAPCOS Limited (hereinafter called the Employer)
KNOW ALL PEOPLE by these presents that we …… (name of the Bank) having our head office at …… (hereinafter called "the Bank") are bound unto Employer in the sum of …… for which payment well and truly to be made to the Employer, the Bank binds itself, its successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this …… day of ……month…… year.

THE CONDITIONS of this obligation are:
(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified;

OR

(2) If the Bidder having been notified of the acceptance of his bid by …… during the period of Bid Validity:

We undertake to pay to the …… up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Bidder will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above mentioned two conditions and specify the occurred condition or conditions.
This Guarantee will remain in force up to and including the date …… after the deadline for submission of Bids as is stated in the instructions to Bidders or as it may be extended by the …… notice of which extension(s) to the Bank is hereby waived and notice to the bidder would constitute sufficient notice to the Bank. Any demand in respect of this guarantee should reach the Bank not later than the above date.
Notwithstanding anything contained herein

i) Liability under this guarantee shall not exceed ……
ii) This bank guarantee shall be valid upto …… and;
iii) Our liability to make payment shall arise and we are liable to pay the guaranteed amount or any part thereof under this guarantee only and only if you serve upon us a written claim or demand in terms of the guarantee on or before …… (indicate a period twelve months after the date of issue of Bank Guarantee).

Dated this _____ day of _____ at……...
Authorized Signatory of …… Bank

Signature	**Signature**
Name……..	**Name……..**
Signature Code/ S.S no. ……	**Signature Code/ S.S no. ……**

ANNEXURE-VII

(To be submitted on Contractor's original Letter Head)

FORMAT FOR SEEKING EXTENSION OF TIME

1. Name of Contractor:
2. Name of work:
3. Agreement No. and Date:
4. Date of commencement of work as per Agreement:
5. Period and Stipulated date of completion as per Agreement:
6. Period for which extension of time already given:

Extension	Period	Reasons Stated earlier for seeking EoT
(a) 1st extension		
(b) 2nd extension		
(c) 3rd extension		
(d) 4th extension		
(e) 5th extension		

9) Reasons for extension (Attach Hindrance Statement in the prescribed format)

10) Period for which extension is applied for

It is understood that we will not claim any additional cost due to above extension of time and also understand that WAPCOS have rights to act in accordance with provisions in relevant clauses of Contract Agreement.

Dated……..

Contractor's Signature and Stamp

HINDRANCE STATEMENT

S.No.	Hindrance	Date of Start of Hindrance	Date of Removal of Hindrance	Activity Effected	Overlaping	Net Hindrance in Days	Weightage	Net Effective Days	Remarks

Annexure – VIII

(On Rs. 100 non- Judicial Stamp Paper duly attested by Notary / Magistrate)

FORMAT FOR GUARANTE BONDS

To Be Executed by Contractor for Structural Stability, Removal of Defects after completion of work

The Supplementary Agreement made this ____ day of _____ 20___ between (Name of Contractor firm & address) _____ (hereinafter called the CONTRACTOR / GUARANTOR of the one part) and the WAPCOS LIMITED, 5th floor, Kailash Building, 26, K. G. Marg, New Delhi (hereinafter called WAPCOS of the other part) for the Work ……(Name of Work) ……in respect of Contract Agreement (hereinafter called the "Original Agreement" signed between ……(Name of Contractor firm) and WAPCOS on…….. dated …….., whereby the contractor interalia, under look to render the work in the said contract recited structurally stable workmanship and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guarantee against faulty workmanship, manufacturing defects of materials etc.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, for the minimum life of ten years, to be reckoned from the date of start of Defect Liability Period or Maintenance Period which ever is later, prescribed in the Contract.

The decision of the WAPCOS with regard to nature and cause of defects shall be final. During the period of guarantee the Guarantor shall make good all defects to the satisfaction of the WAPCOS calling upon him to rectify the defects, failing which the work shall be got done by the WAPCOS by some other agencies at the Guarantor's cost and risk. The decision of the WAPCOS as to the cost payable by the Guarantor shall be final and binding.

That if the Guarantor fails to make good all the defects, commits breach thereunder then the guarantor will indemnify the Principal and his successor against all loss, damage cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and / or damage and / or cost incurred by the WAPCOS the decision of the WAPCOS will be final and binding.

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR ……..(Name and Designation who sign the Original Contract Agreement) on behalf of .....(Name of Contractor Firm) and WAPCOS on the day, month and year first above written.

SIGNED, SEALED AND DELIVERED

For and on behalf of the Contractor	For and on behalf of the WAPCOS
NAME _____	NAME _____
Designation	Designation
in the presence of witness:	**in the presence of Witness**
1_____	1_____
2 _____	2 _____

Annexure – IX

(On Rs. 100 non- Judicial Stamp Paper duly attested by Notary / Magistrate)

FORMAT FOR GUARANTE BONDS
To Be Executed by Contractor for Water Proofing after completion of work

This Agreement made on this ____ day of _____ 20___ between_____ (Name of Contractor firm & address) _____ (hereinafter called the CONTRACTOR / GUARANTOR of the one part) and the _____(hereinafter called Principal Employer of the other part) for Water proofing Works of _____ (Name of Work)

WHEREAS This Agreement is Supplementary, to a Contract (hereinafter called the Contract) Contract no._____ dated _____and made between the _____ (Name of Contractor) and WAPCOS LIMITED, 5th floor, Kailash Building, 26, K. G. Marg, New Delhi, whereby the contractor, inter alia, undertook to render the buildings and structures in the contract recited completely water and leak-proof for Toilets, Shower , Under Ground Tank, Roof, Over Head Tank, Basement and any other allied areas of building.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak-proof for **ten years** from the date after the Defect Liability Period or Maintenance Period which ever is later, prescribed in the contract. NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be **ten years** to be reckoned from the date after the Defect Liability Period / Maintenance Period which ever is later, prescribed in the contract.

Provided that the Guarantor will not be responsible for the leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

a. Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof.
b. Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts.
c. The decision of the Principal Employer with regard to cause of leakage/seepage shall be final.

During this period of guarantee the Guarantor shall make good all defects and in case of any defect being found, render the building water proof to the satisfaction of the Principal Employer at his cost and shall commence the work for the rectification within seven days from the date of issue of the notice from the Principal Employer calling upon him to rectify the defects failing which the work shall be done by the Principal Employer by some other agency at the GUARANTOR's risk and cost. The decision of the Principal Employer as to the cost payable by the Guarantor shall be final and binding. That if Guarantor fails to make good all defects or commits breach there under then the Guarantor will indemnify the principal and his successors against all loss, damage, cost expense otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and/or damage and/or cost incurred by the Principal Employer the decision of the owner will be final and binding on the parties.

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR …….. (Name and Designation who sign the Contract) on behalf of .....

..... .(Name of Contractor Firm) and Principal Employer on the day, month and year first above written.

SIGNED, SEALED AND DELIVERED

For and on behalf of the Contractor Employer

NAME _____
Designation

in the presence of witness:

_1_____

2 _____

2 _____

For and on behalf of the Principal

NAME _____
Designation

in the presence of Witness

_1_____

2 _____

2 _____

ANNEXURE IX (a)

FORM OF BANK GUARANTEE BOND FOR WATER PROOFING WORK

(Not required for the works of Tendered Value below Rs. 5.0 Crore excluding GST)

1. In considerable of the …….(Name of Principal Employer) (hereinafter called "The Owner") having agreed to exempt..... (Hereinafter called the said contractor(s)) from the demand, under the terms and conditions of the Agreement No..... dated.....Made between ..... and ..... For the work of..... (hereinafter called "The said Agreement") security deposit for the due fulfillment by the said contractor(s) of the terms & conditions contained in the said Agreements for the work of Anti water proofing work on production of an irrevocable Bank Guarantee for Rs. (……@0.5% of the Tendered value excluding GST for the project with Tendered Value up to Rs. 50 Crore and 0.30% for the Tendered Value above Rs. 50 Crore), for ten years we ..... (Indicate the name of the bank) (Hereinafter referred to as "the Bank) hereby undertake to pay to the Owner an amount not exceeding Rs. ……(Rupees ……only) on demand by the Owner

2. We..... (indicate the name of the bank) do hereby undertake to pay the amounts due and payable under this Guarantee without any demure, merely on a demand from Principal Employer stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the bank under the Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. ……(Rupees ……only).

3. We..... (indicate the name of the bank) further undertake to pay to Principal Employer any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.
   The payment so made by as under this bond shall be a valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

4. We..... (indicate the name of the Bank) further agree that the guarantee hereinafter contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of Principal Employer under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Principal Employer certified that the terms and condition of the said agreement have been fully and properly carried out by the said contractor(s) and accordingly discharges this guarantee.

5. We…….. (indicate name of the bank) further agree with Principal Employer that Principal Employer shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by Principal Employer against the said contractor(s) and to for bear or enforce any of the terms and conditions relating

to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractors(s) or for any bearance, act of commission of the part of Principal Employer or any indulgence by Principal Employer to the said contractor(s) or by any such matter of thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of Bank or the contractor(s).

7. We…… (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of Principal Employer in writing

8. This guarantee shall be valid upto ..... unless extended on demand by Principal Employer. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. ……(Rupees ……only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged

Dated this _____ day of _____ at……...

Authorized Signatory of …… Bank

Signature **Signature**

Name…….. **Name……..**

Signature Code/ S.S no. …… **Signature Code/ S.S no. ……**

Annexure – X

(On Rs. 100 non- Judicial Stamp Paper duly attested by Notary / Magistrate)

FORMAT FOR GUARANTE BONDS FOR ANTI-TERMITE TREATMENT
To Be Executed by Contractor for Anti Termite Treatment after Completion of Work

This Agreement made on this ____ day of _____ 20___ between_____ (Name of Contractor firm & address) _____ (hereinafter called the CONTRACTOR / GUARANTOR of the one part) and the _____(hereinafter called Principal Employer of the other part) for Anti Termite Treatment Works for_____ (Name of Project)

WHEREAS This Agreement is Supplementary, to a Contract (hereinafter called the Contract) Contract no._____ dated _____and made between the _____ (Name of Contractor) and WAPCOS LIMITED, 5th floor, Kailash Building, 26, K. G. Marg, New Delhi, whereby the contractor, inter alia, undertook to render the wooden work in the said contract recited completely Termite proof.

THE GUARANTOR hereby guarantee that the anti-termite treatment given by him will render the wooden works completely Termite proof and the minimum life of such Anti-Termite treatment shall be five years to be reckoned from the from the date after the Defect Liability Period or Maintenance Period which ever is later, prescribed in the contract.

During the period of guarantee the Guarantor shall make good all defects and in case of any defects being found render the wooden works termite proof to the satisfaction of the Principal Employer at his cost and shall commence the work for such rectification within seven days from the date of issue of notice from the Principal Employer calling upon him to rectify the defects, failing which the work shall be got done by the Principal Employer through some other Agency at the Guarantor's cost and risk. The decision of the Principal Employer as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the Anti-termite works, or commits breach thereunder then the guarantor will indemnify the Principal and his successor against all loss, damage, cost of expenses or otherwise which may be incurred by him by reason of any of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and / or cost incurred by the Principal Employer on the decision of the Principal Employer will be final and binding.

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR …… (Name and Designation who sign the Contract) on behalf of .....(Name of Contractor Firm) and Principal Employer on the day, month and year first above written.

SIGNED, SEALED AND DELIVERED

For and on behalf of the Contractor	For and on behalf of the Principal Employer
NAME _____	NAME _____
Designation	Designation
in the presence of witness:	**in the presence of Witness**
_1_____	_1_____
2 _____	2 _____

ANNEXURE – XI

SAFETY CODES

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1(¼ horizontal and 1 vertical).

2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.).

5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least ¼" for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit; action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person

6. (a) Excavation and Trenching - All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100ft.) in length or fraction thereof, Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from

top to bottom. Under no circumstances, undermining or undercutting shall be done.

(b) Safety Measures for digging bore holes:-

i. If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;
ii. During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer-in-charge of the work;
iii. Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50m all round the point of drilling to avoid entry of people;
iv. After drilling the borewell, a cement platform (0.50m x 0.50m x 1.20m) 0.60m above ground level and 0.60m below ground level should be constructed around the well casing;
v. After the completion of the borewell, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while reparing the pump;
vi. After the borewell is drilled the entire site should be brought to the ground level.

7. Demolition - Before any demolition work is commenced and also during the progress of the work,
   (i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
   (ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.
   (iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned. The following safety equipment shall invariably be provided.
   (i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
   (ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective goggles.
   (iii) Those engaged in welding works shall be provided with welder’s protective eyeshields.
   (iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
   (v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated atleast for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measure are adhered to :-
      (a) Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.
      (b) At least 5 to 6 manholes upstream and downstream should be kept open for at least

2 to 3 hours before any man is allowed to enter into the manhole for working inside.

(c) Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

(d) Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.

(e) Safety belt with rope should be provided to the workers. While working inside the manholes, such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

(f) The area should be barricaded or cordoned of by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.

(g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.

(h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.

(i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.

(j) Gas masks with Oxygen Cylinder should be kept at site for use in emergency.

(k) Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

(l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.

(m) The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

(n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

(o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

(p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:-

(a) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.

(b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.

(c) Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.

9. The Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use :

(i) White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.

(ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.

(iii) Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.

(iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.

(v) Overall shall be worn by working painters during the whole of working period.

(vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.

(vii) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man.

(viii) WAPCOS may require, when necessary medical examination of workers.

(ix) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

10. When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions :-

(i) (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.

(b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

(ii) Every crane driver or hoisting appliance operator, shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

(iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

(iv) In case of departmental machines, the safe working load shall be notified by the Electrical Engineer-in-Charge. As regards contractor's machines the contractors shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer concerned.

12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

13. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in-Charge of the department or their representatives.

16. Notwithstanding the above clauses from (1) to (15), there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

ANNEXURE – XII

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS

FOR WORKERS EMPLOYED BY CONTRACTORS

1. APPLICATION

These rules shall apply to all buildings and construction works in which twenty or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the contract work is in progress.

2. DEFINITION

Work place means a place where twenty or more workers are ordinarily employed in connection with construction work on any day during the period during which the contract work is in progress.

3. FIRST-AID FACILITIES

(i) At every work place, there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

(ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:-

(a) For work places in which the number of contract labour employed does not exceed 50- Each first-aid box shall contain the following equipments :-

1) 6 small sterilised dressings.
2) 3 medium size sterilised dressings.
3) 3 large size sterilised dressings.
4) 3 large sterilised burn dressings.
5) 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
6) 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7) 1 snakebite lancet.
8) 1 (30 gms.) bottle of potassium permanganate crystals.
9) 1 pair scissors.
10) 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
11) 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
12) Ointment for burns.
13) A bottle of suitable surgical antiseptic solution

(b) For work places in which the number of contract labour exceed 50. Each first-aid box shall contain the following equipments.

1) 12 small sterilised dressings.
2) 6 medium size sterilised dressings.
3) 6 large size sterilised dressings.
4) 6 large size sterilised burn dressings.
5) 6 (15 gms.) packets sterilised cotton wool.
6) 6.1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.

7) 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label
8) 1 roll of adhesive plaster.
9) 1 snake bite lancet.
10) 1 (30 gms.) bottle of potassium permanganate crystals.
11) 1 pair scissors.
12) 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes / Government of India.
13) A bottle containing 100 tablets (each of 5 gms.) of aspirin.
14) Ointment for burns.
15) A bottle of suitable surgical antiseptic solution.

(iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary

(iv) Nothing except the prescribed contents shall be kept in the First-aid box.

(v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

(vi) A person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.

(vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.

(viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

(i) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

(ii) Where drinking water is obtained from an Intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

(iii) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.

(iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

(i) In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.

(ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.

(iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES AND URINALS

(ii) Latrines shall be provided in every work place on the following scale namely :-

(a) Where female are employed, there shall be at least one latrine for every 25 females.

(b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that, where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be upto the first 100, and one for every 50 thereafter.

(iii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.

(iv) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year, Latrines shall not be of a standard lower than borehole system.

(v) (a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers “For Men only” or “For Women Only” as the case may be.

(b) The notice shall also bear the figure of a man or of a woman, as the case may be.

(vi) There shall be at least one urinal for male workers upto 50 and one for female workers upto fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereafter.

(vii) (a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

(b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.

(viii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

(ix) Disposal of excreta: - Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

(x) The contractor shall at his own expense, carry out all instructions issued to him by the Engineer-in-Charge to effect proper disposal of night soil and other conservancy work in respect of the contractor’s workmen or employees on the site. The contractor shall be responsible for payment of any charges which may be levied by Municipal or Cantonment Authority for execution of such on his behalf.

7. PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sqm (6 sft) per head.

Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. CRECHES

(i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a,b & c.

(ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

(iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.

(iv) The contractor shall provide one ayaa to look after the children in the creche when the number of women workers does not exceed 50 and two when the number of women workers exceed 50.

(v) The use of the rooms earmarked as creches shall be restricted to children, their attendants and mothers of the children.

9. CANTEENS

a. In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.

b. The canteen shall be maintained by the contractor in an efficient manner.

c. The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

d. The canteen shall be sufficiently lighted at all times when any person has access to it.

e. The floor shall be made of smooth and impervious materials and inside walls shall be limewashed or colour washed at least once in each year.
Provided that the inside walls of the kitchen shall be lime-washed every four months.

f. The premises of the canteen shall be maintained in a clean and sanitary condition.

g. Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

h. Suitable arrangements shall be made for the collection and disposal of garbage.

i. The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.

j. The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square metre (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.

k. (a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.
(b) Washing places for women shall be separate and screened to secure privacy.

l. Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.

m. (a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipments necessary for the efficient running of the canteen.
2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.
(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
2. A service counter, if provided, shall have top of smooth and impervious material.
3. Suitable facilities including an adequate supply of hot water shall be provided for

the cleaning of utensils and equipments.

n. The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

o. The charges for food stuffs, beverages and any other items served in the canteen shall be based on 'No profit, No loss' and shall be conspicuously displayed in the canteen.

p. In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:-
   (a) The rent of land and building.
   (b) The depreciation and maintenance charges for the building and equipment provided for the canteen.
   (c) The cost of purchase, repairs and replacement of equipment including furniture, crockery, cutlery and utensils.
   (d) The water charges and other charges incurred for lighting and ventilation
   (e) The interest and amounts spent on the provision and maintenance of equipment provided for the canteen.

q. The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. ANTI-MALARIAL PRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge including the filling up of any borrow pits which may have been dug by him.

11. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

Government may, from time to time, add to or amend these rules and issue directions - it may consider necessary for the purpose of removing any difficulty which may arise in the administration thereof.

ANNEXURE-XIII

Contractor's Labour Regulations

1. **GENERAL**

These Labour regulations shall be followed by the Contractor.

2. **DEFINITIONS**

(i) Workman means any person employed by contractor directly or indirectly through a subcontractor with or without the knowledge of the WAPCOS to do any skilled, semiskilled or unskilled manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment are expressed or implied but does not include any person :-

(a) Who is employed mainly in a managerial or administrative capacity : or

(b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature: or

(c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the Employer/ Principal Employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of the Employer/ Principal Employers and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal employer.

(i) No person below the age of 14 years shall be employed to act as a workman.

(ii) Fair Wages means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.

(iii) Contractors shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.

(iv) Wages shall have the same meaning as defined in the Payment of Wages Act.

3. (i) Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

(ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week, he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages.

(iii) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time irrespective of whether such worker is governed by the Minimum Wages Act or not.

(iv) Where the minimum wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at the rate applicable to the next preceding

(iv) provided he has worked under the same contractor for a continuous period of not less than 6 days.

(v) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substituted holiday to him for the whole day on one of the five days immediately before or after the normal weekly holiday and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

4. **DISPLAY OF NOTICE REGARDING WAGES ETC.**

The contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clear and legible condition in conspicuous places on the work, notices in English and in the local Indian languages spoken by the majority of the workers giving the minimum rates of wages fixed under Minimum Wages Act, the actual wages being paid, the hours of work for which such wage are earned, wages periods, dates of payments of wages and other relevant information as per Appendix 'III'.

5. **PAYMENT OF WAGES**

(i) The contractor shall fix wage periods in respect of which wages shall be payable.

(ii) No wage period shall exceed one month.

(iii) The wages of every person employed as contract labour in an establishment or by a contractor where less than one thousand such persons are employed shall be paid before the expiry of seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.

(iv) Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.

(v) All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.

(vi) Wages due to every worker shall be paid to him direct by contractor through Bank or ECS or online transfer to his bank account.

(vii) All wages shall be paid through Bank or ECS or online transfer.

(viii) Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.

(ix) A notice showing the wages period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgment.

(x) It shall be the duty of the contractor to ensure the disbursement of wages through bank account of labour.

(xi) The contractor shall obtain from the Junior Engineer or any other authorised representative of the Engineer- in-Charge as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum-Muster Roll" as the case may be in the following form:-

6. **FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES**

i) The wages of a worker shall be paid to him without any deduction of any kind except the following:-

a. Fines
b. Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
c. Deduction for damage to or loss of goods expressly entrusted to the employed person for custody or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.
d. Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.
e. Any other deduction which the Central Government may from time to time allow.

ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.
Note :- An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-X

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

iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the total wages, payable to him in respect of that wage period.

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

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

7. LABOUR RECORDS

i) The contractor shall maintain a Register of persons employed on work on contract in Form XIII of the CL (R&A) Central Rules 1971 (Appendix IV)

ii) The contractor shall maintain a Muster Roll register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).

iii) The contractor shall maintain a Wage Register in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI).

iv) Register of accident - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
a. Full particulars of the labourers who met with accident.
b. Rate of Wages.
c. Sex
d. Age
e. Nature of accident and cause of accident.
f. Time and date of accident.
g. Date and time when admitted in Hospital,
h. Date of discharge from the Hospital.
i. Period of treatment and result of treatment.
j. Percentage of loss of earning capacity and disability as assessed by Medical Officer.
k. Claim required to be paid under Workmen's Compensation Act.

l. Date of payment of compensation.
m. Amount paid with details of the person to whom the same was paid.
n. Authority by whom the compensation was assessed.
o. Remarks

v) The contractor shall maintain a Register of Fines in the Form XII of the CL (R&A) Rules 1971 (Appendix-XI) The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omissions for which fines can be imposed (Appendix-X)
vi) The contractor shall maintain a Register of deductions for damage or loss in Form XX of the CL (R&A) Rules 1971 (Appendix-XII)
vii) The contractor shall maintain a Register of Advances in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII)
viii) The contractor shall maintain a Register of Overtime in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV)

8. **ATTENDANCE CARD-CUM-WAGE SLIP**

i) The contractor shall issue an Attendance card-cum-wage slip to each workman employed by him in the specimen form at (Appendix-VII)
ii) The card shall be valid for each wage period.
iii) The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.
iv) The card shall remain in possession of the worker during the wage period under reference.
v) The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.
vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

9. **EMPLOYMENT CARD**

The contractor shall issue an Employment Card in Form XIV of the CL (R&A) Central Rules 1971 to each worker within three days of the employment of the worker (Appendix-VIII).

10. **SERVICE CERTIFICATE**

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a Service certificate in Form XV of the CL (R&A) Central Rules 1971 (Appendix-IX)

11. **PRESERVATION OF LABOUR RECORDS**

All records required to be maintained under Regulations Nos. 6 & 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-in-Charge or Labour Officer or any other officers authorised by the Ministry of Urban Development in this behalf.

12. **POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY**

The Labour Officer or any person authorised by Central Government on their behalf shall have power to make enquires with a view to ascertaining and enforcing due and proper observance of Fair Wage Clauses and the Provisions of these Regulations. He shall investigate into any

complaint regarding the default made by the contractor or subcontractor in regard to such provision.

13. **REPORT OF LABOUR OFFICER**

The Labour Officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Engineer-in-charge concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under Clause 13 of these regulations, actual payment to labourers will be made by the Engineer-in-charge after the Competent Authority of WAPCOS has given his decision on such appeal.

(i) The Engineer-in-charge shall arrange payments to the labour concerned within 45 days from the receipt of the report form the Labour Officer as the case may be.

14. **APPEAL AGAINST THE DECISION OF LABOUR OFFICER**

Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Engineer-in-charge concerned within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Engineer-in-charge concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

15. **PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER**

(i) A workman shall be entitled to be represented in any investigation or enquiry under these regulations by:-
   a. An officer of a registered trade union of which he is a member.
   b. An officer of a federation of trade unions to which the trade union referred to in clause (a) is affiliated.
   c. Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.

(ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by :-
   a. An officer of an association of employers of which he is a member.
   b. An officer of a federation of associations of employers to which association referred to in clause (a) is affiliated.
   c. Where the employers is not a member of any association of employers, by an officer of association of employer connected with the industry in which the employer is engaged or by any other employer, engaged in the industry in which the employer is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

16. **INSPECTION OF BOOKS AND SLIPS**

The contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Officer or any other person, authorised by the Central Government on his behalf.

17. **SUBMISSIONS OF RETURNS**

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

18. **AMENDMENTS**

The Central Government may from time to time add to or amend the regulations and on any question as to the application/Interpretation or effect of those regulations the decision of the Engineer-in-charge concerned shall be final.

SECTION – VII

TERMS OF REFERENCE

SECTION-VII
TERMS OF REFERENCE

1.0 INTRODUCTION

WAPCOS Limited, as Project Management Consultant (PMC) on behalf of Sashastra Seema Bal (SSB) invites bids from qualified and experienced Contractor for the Development & Construction of Battalion Head Quarters of SSB at Araria, Bihar, hereinafter referred to as the Project /Work.

2.0 PROJECT BRIEF

Sashastra Seeme Bal (SSB), Ministyy of Home Affairs, Govt. of India has identified around 42.56 acres of land to Develop and Construct the Infrastructure facilities at the Battallion Head Quarter at Araria, Bihar. The approximate plinth area of the Infrastructure facilities to be developed will be 11661.67 Sqm.

The project shall include construction of Admin Block / Training Block and Offices, Barrack, Residential Quarters, Electrical Sub-station, Water Tank including Civil, Electrical, MEP works including External development, internal roads including footpaths, Water Supply Distribution Network, Storm Water Drainage Network, Rain Water Harvesting Structures, Underground water tanks (UGT) for fire and domestic drinking water, Boundary walls, Horticulture & Landscaping works, Sewage Treatment Plant, Fire-fighting system, Sub-stations etc.

In order to develop the SSB Battalion Head Quarter at Araria, Bihar, WAPCOS intends to engage an EPC Contractor for **Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I.**

3.0 SCOPE OF WORK

The tentative layout plan and conceptual architectural plans of proposed buildings are provided in the NIT document. The Contractor shall engage an Architect, who shall provide complete planning and design, architectural and engineering drawings, detailed working drawings, structural drawings, service drawings for all buildings and development works & services required for completing the project. All the structural drawings of the components of the project shall be prepared in accordance with the approved Architectural Drawings provided with the Tender Documents. All the Structural Drawings shall be submitted to WAPCOS after vetting from IIT. The execution shall be done on the basis on the approved working architectural & structural drawings, CPWD Specifications, relevant IS codes, National Building Code (latest), Harmonized Guidelines & Standards for Universal Accessibility in India 2021 and other standard specifications shall be followed in general except otherwise mentioned in bid document. Samples of the materials of approved make or otherwise shall be got approved from the Engineer-in-charge before use in the work.

The execution shall be done on the basis of drawings and schedule to be prepared by the EPC Contractor with due approval of WAPCOS.

The scope of work includes the Development and Construction of plinth area of 11662 Sqm including all development works as mentioned below and duly incorporating the

Technical Specifications of the buildings/structures given in the Section-VIII of Agreement / Tender Document.

Sl. No.	Building / Component	Total Plinth Area (Sqm)	No. of Storeys	No. of Blocks / Building	No. of Units per Floor
A	**OB Buildings**				
1	Admin Block / Training Block and Offices	2486.90	G+2	1	-
2	1 No. 128 Men Barrack	2228.79	G+2	1	-
	Sub-Total (A)	**4715.69**			
B	**RB Buildings**				
1	Residential Quarters - Type-II / 36 Nos.	3263.40	S+9	1	4
2	Residential Quarters - Type-III / 24 Nos.	2418.00	S+6	1	4
3	Residential Quarters - Type-IV / 06 Nos.	863.58	S+3	1	2
4	Residential Quarters - Type-V / 02 Nos.	401.00	G	1	1
	Sub-Total (A)	**6945.98**			
	Total (A+B)	**11,661.67**			
C	**Development Works**				
1	Boundary Wall	1940m (approx) length			
2	Gate and Guard Room	As per Drawing attached with NIT			
3	Electrical Sub-Station	500 kVA			
4	Internal Roads and Pathways / Footpaths and Street Light	As per LoP attached with NIT			
5	Internal Water Supply and Sewerage System	To be designed by the Successful bidder			
6	Underground Water Tank	100 KL			
7	Sewage Treatment Plant	150 KLD			
8	Rain Harvesting Systems	As per requirement			
9	Diesel Generator	300 kVA			
10	Other allied works for the smooth operation of entire Buildings in SSB Battallion	Refer specification in Section 8 of NIT			

4.0 DEATILED SCOPE OF WORK

In order to execute the project, the detailed scope of work includes topographical Survey, Soil Investigation, preparation of architectural and engineering drawings, detailed working drawings, structural design & drawings of buildings, required services i.e. electrical installations including all electrical fittings / fixtures etc. Lightning protection and Earthing system, Fire fighting, fire detection, Lifts (if any), and any other services required but not specifically mentioned. Signages, liaisoning with local bodies for obtaining the pre-construction and post-construction clearances for which nothing extra shall be paid to the contractor. Thereafter complete construction and commissioning of building(s) alongwith all mentioned services is in the scope of the work.

The detailed scope of work includes:

- Topographical Survey
- Soil Investigation
- Preparation of Architectural and engineering drawings
- Structural design & preparation of drawings

- Detailed working drawings for structure, Rain water harvesting, services, landscaping, tree / plantation etc
- Detailed PERT Chart shall be prepared by the Contractor in reference to the “Detailed Implementation Schedule" given in the Terms of Reference of the tender Document.
- Liaisoning with statutory agencies for obtaining the pre-construction and post-construction clearances.
- Planning and Design of internal Electrical System, Water Supply System and Sewerage System of buildings
- Construction and Commissioning of building(s) complete alongwith the above mentioned services.
- Obtaining mandatory (Pre & Post Construction) approvals from all local bodies/ State & Central authorities/ Municipal Corporation, fire clearance etc. for the complete work in scope of the contract. Approvals (Pre & Post Construction) as per latest local building Byelaws / Town & Country Planning Bye laws with upto date corrections slips, necessary Clearance from the appropriate authority, NOC from Fire Department, NOC from Airport Authority of India (if any) etc. and any other statutory approval /Central Licensing Approving Authority etc. related to project, approval from authorities required for commencing the work, execution of work & services and handing over the assets. The defect liability period after completion of work shall be 2 years. The contractor has to withstand the warranty and has to provide the repair services to buildings and all equipments & accessories during the Defect Liability Period. The contractor has to attend the complaints of minor nature within 24 hours and the complaint of major nature within 3 days of receiving the complaints. For this purpose, the contractor has to depute sufficient number of technical manpower within the Project complex. **In case, if the complaint is not attended and rectified by the contractor within the specified period as above the work shall be got rectified by the WAPCOS and the recovery at the double rate of cost of execution of work shall be recovered from the dues of the contractor.**
- The cost of labour, material, tools and plants and machinery required for execution of the whole project as per Layout plan (LoP) & detailed design and drawings to be approved, specifications etc. is within the scope of work.
- The Specifications of the works are finalized and provided in the Tender Document. The Contractor shall ensure that the construction work is executed strictly as per drawings approved by WAPCOS. No deviation from the working drawing shall be made and if so done shall be at the risk of Contractor. If during construction some deviation in drawing is necessitated same shall only be with the approval of the PMC whose decision shall be final.
- The Contractor shall be responsible for Quality / workmanship supervision for ensuring good quality workmanship, standard specifications, proper fund management and timely completion of the activities and milestones to be achieved by Contractor.
- The Contractor shall obtain all necessary Registrations / approvals for the project / territory as required for ensuring smooth implementation of the project
- The Contractor shall ensure strict adherence of all the statutory compliances including Labour Laws etc for ensuring successful completion of the project.

- The Contractor shall take the risk and responsibility of maintaining security, law and order till handover of entire project.
- WAPCOS shall release payment to Contractor, upon availability of funds, on behalf of SSB after assuming
  a) Achievement of payment milestones by Contractor
  b) Quality of works executed strictly as per Drawings, Design and Specifications finalised by WAPCOS
  c) Quantity / Quality of works executed as per Drawings, Designs and Specifications.

- The Contractor shall also ensure the following:
  a. Visit and examine the construction site and satisfy the nature of means of communications, extent and magnitude of the work and facilities for obtaining materials etc. and shall obtain generally other requisite information. Any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description, will not be allowed.
  b. Include in his rates for forming access to site with all temporary roads gateways required for the work.
  c. Shall setout the site in accordance with the approved plans. All grid/central lines shall be pegged and shall be responsible for the correctness of the laying out and any inaccuracy be rectified. Shall also be responsible for taking levels of work at the site before setting out and recording them.
  d. Shall provide during the progress of work and maintenance period proper means of access, with ladders, gangways etc. and the necessary attendant to move and adapt as directed for the inspection of measurement of the works.
  e. Shall provide necessary stores of adequate dimension for storage and protection of materials, which shall be cleared away on completion of the contract. All materials stored shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials. All materials brought to the site of work shall be of reputed make / ISI certified supported by proper documents / vouchers. The materials brought to site shall be checked with proper documents/voucher before storing.
  f. The Contractor shall, if required, arrange to test materials and/or portions of the work in order to prove their soundness and efficiency. If after any such test the work / portion of work is found to be defective or unsound, the Contractor shall pull down and redo the same.
  g. PMC shall prepare and submit for approval, a Bar chart showing the programme of construction of various items / milestones fitted within the period stipulated for completion along with submission of the tender. The Contractor shall also furnish necessary particulars for compiling weekly progress report in the stipulated form.
  h. The Contractor shall provide duplicate copies of large coloured photographs not less than 25 x 20 cm (HD Photographs giving clear understanding and details of work completed/ stage completed/ work progress) of the works of each completed activity / milestone for which payment is recommended. Video recording of construction activities especially casting works shall also be supplied.
  i. The Contractor shall properly cover up and protect all work throughout the duration of work and until completion particularly masonry, mouldings, steps /

special floor finishing, staircase, door and window frames, plaster, angles, lighting & sanitary fittings, glass, paint works and finishing till the same is handed over.

j. The Contractor shall maintain Safety Codes
k. The Contractor shall be provided (i) Land for implementation of project for temporary site installation and labour hutments (free from all encumbrances)
l. The Contractor shall provide before release of each payment detailed site visit report along with a certification that works completed / milestones achieved is strictly as per approved design, drawings and specification.
m. The Contractor must satisfactorily complete any/all other additional activities as assigned by WAPCOS in the interest of the Project.
n. The Contractor must do all needful required for timely completion of Project.
o. The Contractor must comply to any / all observations, requirements and obtain all necessary approvals of Third Party Monitors / State & Central Government Department / Authorities.
p. The Contractor must comply to any/all observations, requirements and obtain all necessary approvals, etc of Pollution Control Board/ MoEFCC/ CGWA/ Local, State & Central Government Departments/ authorities as and when required in the interest of the Project.

The Contractor shall complete all Project approvals / clearances from all the statutory bodies, completion of all Project Preparatory works, Site Developments & Site Mobilization works which also includes:

(a) Starting construction activities of the Project after all approvals (after finalisation of architectural plan, structural design & drawing, vetting by competent authority). The Contractor must ensure timely Submission of all required documents fees expenses compliances etc required for Approvals, PCB's Consent to establish & Operate, SEIAA's/ MOEFCC's Environmental Clearances (if applicable), Aviation Clearances (if applicable), NoC from Fire Fighting Services Department, Approval from State Electricity Inspectorate, other applicable Clearances/ approvals/ sanctions required for commencement and completion of all Project Works.

(b) Site Office of PMC and Contractor, Temporary Labour Hutments & Material Storage Godowns, Temporary Construction Power Supply arrangements, Water Boring/Water arrangement for Drinking purposes for Labourers and construction water, filling and levelling of site etc.

(c) The buildings are to be planned and registered to meet **THREE STAR GRIHA** rating. The contractor is required to execute the work in a befitting manner to suit these standards. The contractor shall take all precautions and abide by all rules, regulations and directions of the regulatory authorities, municipalities, traffic, labour, green tribunal in respect of all kind of pollution, C&D waste management, labour safety measure etc.

4.1 Electrical Works

The scope of work includes Planning, Designing, supply, installation, testing and commissioning of following internal electrical mechanical services of buildings in the scope of work on Engineering, Procurement and Construction (EPC) Basis:

a) Wiring for internal electric installation i.e. light & fan point, light & power plug with modular switch, socket and accessories, LED Fittings, Exhaust/Fresh air fan, Ceiling fan, switch board, SDBs, floor panel, main panel, separate rising main for UPS, Essential & Non-essential supply, Earthing, lightening conductor and lightening arrestor, Area compound lighting with LED fitting & poles etc. Fire survival cable as per the approved drawing shall be provided for automatic fire alarm system.

b) Sign board and Exit signages shall be provided for the various services, at various floors of the building as per requirement.

c) Fire Figthing System with wet riser & sprinklers for the buildings and equipments as per the requirement of NBC 2016 with upto date amendments, updated BIS codes, Fire Bye-laws of Govt. of Tripura and CPWD specifications and as per specifications and makes. This will also includes peripheral header/ring mains and isolation of ring main at minimum 3 points in the header around the building, the provision of testing valve in the fire pump house with the facility to transfer the water again in the fire sump to avoid the wastage of water, isolation valve in the feeder pipe line to each and every wet riser in the building, electric & diesel fire pump, internal fire hydrants, Portable fire extinguishers etc.

d) Provision of addressable automatic fire alarm system complete with detectors, addressable fire alarm panel, and all other related assocceries to cater the requirements of relevant CPWD specifications, fire services norms of local body and NBC (latest) etc as required.

e) Provision of Lifts (if any) in buildings : The design parameters of lifts are as per NBC-2016 and CPWD Specifications.

f) Power cabling work shall be with XLPE insulated PVC sheathed armoured cable as per IS 7098 only.

g) The scope of the work of contractor includes Quality Assurance Policy & Check List of E&M Services as per CPWD Hand book as amended upto date and obtaining mandatory approvals from local bodies/ State & Central authorities/ Municipal Corporation, clearance NOC from Fire Department etc. The scope of work also includes two year defect liability period of all E&M services as mentioned above.

Note

i. All works has to be executed as per specifications provided in the bid document, CPWD Specifications (for Civil Works, Electrical Works and Horticulture &

Landscaping works) and National Building Codes (latest), (in case of difference if any, stringent / higher specification of the two shall be followed). In absence of CPWD Specification, IS Codes, MoRTH Specifications, National Building Code (latest) & sound engineering practices and other standard specifications suitable for buildings and latest technology shall be adopted as per order of precedence defined in the contract.

ii. The scope of works & specification are given in general but they are not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/ or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the contract document/specifications but will be necessary to complete the items in all respect. All these incidental works/ costs which are not mentioned, but are necessary to complete the work shall be deemed to have been included in the overall amount quoted by the contractor for various components of work. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation/change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of Engineer-in-charge. Nothing extra shall be payable on this account.

iii. In case, some of descriptions are missing in the scope of work or specifications in the bidding documents, items / work shall be executed as given in the CPWD Specifications, NBC-2016, IS Codes and according to sound engineering practices so as to make the building including related services fully functional. No claim what so ever shall be entertained at later stage. All cost of providing and making project / buildings with services, landscape and horticulture works fully complete and making buildings functional in all aspect unless specifically mentioned in the contract document.

iv. **Deviation in the Plinth Area given in the NIT**: In case of deviation in Plinth Area upto 5%, given in the NIT, on positive side, will not be counted for payment and the payment shall be made only for the Plinth Area mentioned in the NIT. For deviation in Plinth Area, given in the NIT, beyond permissible 5% on positive side, shall be paid on the quoted rates of the contractor. Deviation in Plinth Area, given in the NIT, on minus side shall be admissible as per the quoted rates only.

v. In case of change in specification of any item of the contract and same being available in DSR 2023 with another item also being available in the DSR-2023, variation in cost (Plus/Minus) shall be made as per difference of cost of the respective items in DSR 2023, increased/ decreased by the quoted % (Plus/ Minus)(as quoted by the bidder for the building/item/work in question) and such increase/decrease shall be applicable only for the actual executed quantities to be measured separately.

4.2 Brief Description of Activities

a) Planning

- Survey, investigation (including soil investigation) and other related works & services.

- Architectural planning & Structural designing of buildings & services in the campus and obtaining all statutory/ local body approvals (Pre & Post Construction) through the Statutory bodies. The Contractor shall also take permission from Municipality/ Fire Department/ Environment/ Pollution control Board, other necessary approvals from local bodies etc required to start construction work as per plinth area given. Signature / authority of department or the client department whenever required shall be provided to the contractor. All liasoning and charges to the concerned authority shall be paid by the contractor for obtaining the clearance. The charges so paid by the contractor are in the scope of the work. This also includes Environmental Impact Assessment & clearance and compliance, Traffic Impact assessment and design of merging/ demerging of traffic etc.

- The structural design of earthquake resistant RCC framed structure buildings & design of services in the campus and getting approval from PMC and vetting of drawings by any IIT approved by WAPCOS and cost for the same shall be borne by Contractor.

- Design and construction of buildings, services, fittings etc. as per 3 STAR GRIHA rating including dual plumbing system (One from the normal water supply line and the other from the treated water supply of STP for flushing, horticulture purpose), energy saving LED lights etc.

- Building shall be designed for differently-abled persons as per the latest norms of Central Govt.

- In case of any stream/nalla/channel/canal in the site, the contractor shall design the structres in such a way that the natural flow shall not be obstructed.

- The contractor shall visit the site and make himself aware of the actual site conditions. In case of any depressions in the site, the contractor shall ensure the safe and sound structrues designed and constructed. No extra claim shall be entertained by on account of site conditions.

- The guidelines & regulation issued by National Disaster Management Authority for management of building should also be incorporated in the design of building.

b) Execution of Works

- After approval from WAPCOS and getting approval from local bodies including necessary modifications as per the requirements, execution of work as per the scope of buildings & services defined in the contract document, CPWD Specifications, NBC (latest), IS Codes, MoRTH Specifications and Sound Engineering Practices and handing over the assets.

- Submission of completion plan of the buildings & services including getting approval/ clearance from local bodies. Submission of buildings & services plan & drawings and other related documents both in hard copy 6 nos. and the soft copy (in Auto CAD and other software used for the purpose) after completion (i.e. 'as-built').

- Clearance of site before Handing over of the buildings and facilities after fulfilling all the obligations under the contract.

- Obtaining necessary clearances/licenses from different local bodies/ statuary authorities required to make project fully operational during/ after completion of work.

c) Defect Liability Period

Defect Liability Period for works executed by the Contractors is 2 years after completion of project in all respect.

5.0 NOC'S / APPROVALS/ CLEARANCE FROM LOCAL BODIES/ AUTHORITIES

All the necessary Statuary Approvals/ NOCs/ Clearances such as Forest NoC, if necessary; approval of local Govt. body for architectural plans; Approval of ground water board, if necessary; clearance of height from concerned authority, if any; Fire NoC, Lift NoC, if any; which are required from any Govt. Department / body, before start of the work / during execution of work / after execution of work & before handing over the project, are the responsibility of the Contractor and are in the scope of work of the Contractor.

If any modification/revision is required in all the above mentioned Statuary Approvals/ NOCs/ Clearances, before start of the work / during the work / after execution of work are the responsibility of the Contractor and are in the scope of work of the Contractor. The fee deposited for getting approvals, shall be deposited by the Contractor to the concerned Department / Authorities and no extra cost for the same shall be claimed by the contractor.

6.0 REFERENCE TO THE STANDARD CODES OF PRACTICE

All Standards, Technical Specifications and Codes of practice referred to shall be latest editions including all applicable official amendments and revisions. The Contractor shall make available at site hard copies of all latest editions of relevant codes and specifications such as CPWD Specifications, Delhi Schedule Rates, CPWD Specifications for Horticulture and Landscaping work, and relevant/ applicable latest BIS codes.

Wherever Indian Standards do not cover some particular aspects of design/ construction, relevant International Standards shall be referred to. The Contractor shall make available at site such standard codes of practice.

7.0 LIST OF MAKE FOR CIVIL WORKS

Acceptable makes of materials to be used in the work are as follows. In case of non-availability of these makes, after the approval of WAPCOS, the Contractor can use the alternative makes only BIS marked materials of equivalent reputed brand. Non BIS

marked materials may be permitted by the WAPCOS only when BIS marked materials are not manufactured. If any make / brand of the “Material / Article” is not mentioned in following make list, then standard top 5 Manufacturers/ Agencies /Brand Make for that “Material / Agency” will be considered for approval by WAPCOS.

S.N	Material /Article	Confirming IS Code	Manufacturers/ Agencies /Brand Make
1.	Cement (OPC / PPC)	IS : 8112: 1989/ IS : 1489 (Part-1) 2015	A.C.C., Jaypee Cement, Ultratech, Shri Cement, Gujart Ambuja Cement, Star Cement, Cement Corporation of India, Dalmia InfraPro (Dalmia Bharat Cement),
2.	AAC Blocks	-	Xtralite (Ultra Tech Cement Ltd.) Areocon (Hil), Nucon (Green Way building material India Pvt Ltd.), Magicrete (Magicrete Precast), NCL
3.	Steel Reinforcement	IS 1786:2008	Thermo Mechanically treated bars Fe-500 Grade conforming to IS 1786:2008 from approved brands i.e. SAIL, Tisco, RINL, JSW Steel Ltd, JINDAL, Shyam Steel
4.	Structural Steel	IS 2062:2011	SAIL, Tisco, RINL, JSW Steel Ltd, JINDAL, Shyam Steel
5.	Stainless Steel	-	Jindal SS Ltd (JSL), Salem (SAIL), SAIL (SAIL), Shyam Steel
6.	Corrugated GI Sheets	IS 277:2003	TATA SAIL, JSW, JSPL, BHUSAN
7.	Colour coated profile sheet	-	TATA KOMDA; JINDAL
8.	Aluminium extruded sections	IS 733: 1983 & IS 1285:2002	Jindal, Hindalco, Indian Aluminium Co. NALCO
9.	Aluminium plain sheets	IS 733: 1983 & IS 1285:2002	Jindal, Hindalco, Indian Aluminium Co. NALCO
10.	Factory made Machine pressed laminated flush door shutter	IS 2202 (Part 1): 1999 And relevant IS Code	Century, Greenply, Kitply, Duroply Merino
11.	Block Board	IS 1659:2004	Century, Greenply, Kitply, Duroply Merino
12.	Flush Door Shutter	IS 2202 (Part 1): 1999	Century, Greenply, Kitply, Duroply Merino
13.	Boiling Water proof plywood, Block board, Commercial Plywood	IS 303:1989	Century, Greenply, Kitply, Duroply Merino
14.	Aluminium door & window fittings	Relevant IS Code	Jyoti, Argent, Everest
15.	PVC rigid foam sheet	-	Rajshri or equivalent
16.	Hydraulic Floor Spring	IS 6315:1992	Dorma, Hardwin, Ozone, Dorset
17.	Door Closure	IS :3564	Dorma, Hardwin, Ozone, Dorset

S.N	Material /Article	Confirming IS Code	Manufacturers/ Agencies /Brand Make
18.	Float Glass	-	Saint Gobain (Saint Gobain India Pvt. Ltd.) Modiguard (Gujarat Guardian Ltd.) Asahi (Asahi India Glass Ltd.)
19.	SWR uPVC pipe & fitting	IS 4985:2000 & IS 14233:1999	Supreme, Finolex, Prince Astral, Prakash, Ashirwad
20.	CPVC Pipe & fittings	IS 16088:2012, IS 15778:2007	Supreme, Finolex, Prince Astral, Prakash, Ashirwad
21.	Ceramic glazed wall tiles	IS 13712:1993	Kajaria, Orientbell, Somany, NITCO, HR-Johnson
22.	Vitrified Tiles	IS 15622:2006	Kajaria, Orientbell, Somany, NITCO, HR-Johnson
23.	Bitumen VG-30, VG-10 Etc.	IS 73:2013	As per particular Specification of IOCL, BPCL, HPCL.
24.	Admixtures	IS9103:1999	FOSROC, SIKKA, CICO Technologies Ltd. Pidilite
25.	Mild steel tubes	IS 1239:1990	As per IS Code
26.	1st quality acrylic distemper (Ready Mix)		Bison (Lewis Berger), Beauty (NEROLAC), Tractor Uno (Asian Paints)
27.	Premium Acrylic smooth exterior Paint with silicon additives		ULTIMA (Asian Paint), Premium Exterior Emulsion (Dulux), Weather coat long life 7 (Berger)
28.	Paints	IS : 101 : 1986	Lewis Berger, Asian Paints, Nerolac, Dulux
29.	Steel/Wood Primer Paints	IS : 14177 : 1994	Lewis Berger, Asian Paints, Nerolac, Dulux
30.	Factory Made C.C. Interlocking Paver Blocks	IS : 15658 : 2006	NITCO, KK, NTC
31.	Bitumen 85/25	IS : 702 : 1988	HPCI, IOCL
32.	Water Proofing Compound	IS : 2645: 2003	FOSROC, Dr. FIXIT, BASF,CICO, SIKKA
33.	Crystalline Waterproofing Compound	IS : 2645: 2003	FOSROC, Dr. FIXIT, BASF, SIKKA
34.	G.I. Pipes	IS : 1239	TATA, Jindal Hissar
35.	PVC Water Storage Tanks	IS : 12701 : 1996	Sintex, Plasto
36.	P.T.M.T. Accessories	IS : 9763	Prayag, Prakash
37.	Mirror		Saint Gobain (Saint Gobain India Pvt. Ltd.), Modiguard (Gujarat Guardian Ltd.) Asahi (Asahi India Glass Ltd.), Atul (Autl Glass Industries Ltd.)
38.	Stainless Steel Sink	IS : 13983 : 1994	Hindware, NIRALI, CERA, JAYNA
39.	Sanitary ware /Chinaware	As per IS Code	Cera, Parryware, Hindware, Jaquar

S.N	Material /Article	Confirming IS Code	Manufacturers/ Agencies /Brand Make
40.	C.P. Fittings and accessories for bathroom/toilets	IS: 7784 : 1993	Jaquar, Gem, Parko, Hindware, Cera, Parryware
41.	RCC Pipes	Confirming to IS Specification	Indian Hume Pipes (Indian Hume Pipe Ltd.) Jain & Co (Jain Spun Pipes Co)
42.	SFRC Cover and grating	IS 12592 (2002)	KK (KK Manhole and gratings Co Pvt Ltd)
43.	CI Manhole Cover	IS 1726 (1991)	RPFM (M/s Raj Pattern Makers & Founders Pvt Ltd.) BIC Bengal Iron Corporation), Neco (Jayaswal Neco Ltd.)
44.	Foot Rest (for Manhole)		KGM (KGM Exports), Accurate Buildcon (Accurate Buildconcompany) Neco (Jayaswal Neco Ltd)
45.	Water stops		Hydrotite (Sika India), Dr. FIXIT (Pidilite Industires), Ferrous Crete (Ferrous Crete (India) Pvt. Ltd.)
46.	Aluminium doors/windows sections	IS 733 & IS 1285	Hindalco (Hindalco Industries Ltd.) Jindal (Jindal Aluminium Ltd)
47.	Glass Reinforced Concrete (GRC) jail		Terrafirma (terrafirma GRC Industries), Ecovision (Ecovision Industries Pvt Ltd.). Mahesh GRC (Mahesh Prefab Pvt Ltd.)
48.	SS Doors & Windows Hardware & Fittings		JINDAL, Dorma, KICH, Godrej, Ozone
49.	Wall Putty		Dalmia, JK, Birla, Asian
50.	Factory Made steel Glazed/ Gauged windows and ventilators	IS : 1038-1983	SKS Steel Industries (Havlox)/Madhu Industries /Multiwin
51.	Solar Lighting System	ECBC-2017	WIPRO/Anchor-Panasonic/Philips/TATA BP solar
52.	CP Fittings	IS : 8931	Jaquar, Kohler, Marc (Premium Quality), Hindware
53.	Tubular Profile steel door/ windows; Steel windows; Pressed steel door frames		TATA/APL Apollo/ Jindal/ Classic Engineers & fabricators
54.	Pre painted / powder coated CRC Windows		APL Apollo/ Jindal/ Classic Engineers & fabricators/ JK Enterprises/ NCL Alltek & Seccolor Ltd.

8.0 LIST OF MAKE FOR ELECTRICAL WORKS

Acceptable makes of materials to be used in the work are as follows. In case of non-availability of these makes, after the approval of SMFPL/ PMA, the Contractor can use the alternative makes only BIS marked materials of equivalent reputed brand. Non BIS marked materials may be permitted by the WAPCOS only when BIS marked materials

are not manufactured. If any make / brand of the "Material / Article" is not mentioned in following make list, then standard top 5 Manufacturers/ Agencies /Brand Make for that "Material / Agency" will be considered for approval by SMFPL/PMA.

S.NO.	Material /Article	Manufacturers/ Agencies /Brand Make
a)	DG Engine	Ashok Leyland/Cummins/Cater pillar/KOEL Mahindra & Mahindra/Escorts
b)	DG Alternator	Kirloskar/KEL/Crompton Greaves (AL. Series)/KEC/ Stamford
c)	Battery (Lead Acid / Mntc. Free)	Amara Raja/Exide/Crompton Greaves/Prestolite/Pace Setter/Standard/
d)	HV Switchgear	Crompton/Kirloskar/Voltas/C&S Electric
e)	LT Switchgear	L&T/Schneider Electric/Siemens/Legrand/Havells
f)	Vaccum Circuit Breaker	GE/Siemens/C&S Electric
g)	Transformer (Oil filled / Dry Type)	ABB/ Crompton Greaves/ Kirloskar/ Siemens / Alstom
h)	HT Panels	ABB/ Siemens/ L&T/Schneider/Kirloskar
i)	Air Circuit Breaker	L&T/Schneider Electric/Siemens/Havells
j)	MCCB (ICS=ICU)	L&T/Schneider Electric/Siemens/Legrand/Havells
k)	MV/LT Panels	TTA/CPRI Fabricators with panels cleared by CPRI. **Note:** Contractor shall take prior approval of make of Panels before procurement.
l)	SDF Units	L&T/Schneider Electric/Siemens/Legrand/Havells
m)	Power Contractors	L&T/Schneider Electric/Siemens/BCH/GE/Power Controls
n)	Change Over Switch	L&T/HPL/Havells/Standard/Control & Switch Gears
o)	Air Brake Switch	National/Kiran/Pactil/Atlas/Power grid switchgears
p)	Pin and Disc Insulator	Jayshree/WS/IEC/BHEL/Bharat Industries
q)	11 KV Horn Gap Arrestor	Sahal/Pactil/GEC/SEW
r)	Lightning Arrestor	Atlas/GE/Elaro/Lamco/International Oblum/ Elpro
s)	Drop out Fuses	National /Kiran/Pactil
t)	GI/MS Pipe (ISI Maked)	ATC/ATL/BST/GSI/ITC/ITS/ IIA/JST/Jindal/TTA/ Tata/Zenith
u)	APFC Relay	L&T/Schneider Electric/Neptune Ducati/Syntron/Trinity Electronics
v)	IDMT Relay	AVKC/SEGC
w)	C.T./P.T.	AE/MP/Marshal/Pactil/Kappa/L&T/Ashmor/Waco/Meco/ Gilbert/ Trio/Indotech/Indo coil
x)	Selector Switch	L&T/Kaycee/IMP/Vaishno/Seizer/rass control
y)	Indicating Lamp (LED Type) and Push But	Vaishno/Siemens/L&T/AE/IMP/Rass
z)	Power Capacitors (MPP/APP)	Khatau/Junkar/L&T/ EPCOS(Siemens)/ABB/Crompton/Schneider Electric / Neptune Ducati
aa)	Digital Panel Meters i/c Multi-Function Meter	Conzerv/Schneider Electric/AE/Digitron/IMP/Meco/ Rishabh/Univeral/HPL/L&T/ABB

S.NO.	Material /Article	Manufacturers/ Agencies /Brand Make
bb)	Ammeter/ Voltmeter	AE/Univeral/Rishabh/Kaycee/Meco/Enercom
cc)	Cold shrink HT/LT Cable Joint Kit	Denson/3M(M-Seal)/Paychem
dd)	Rubber Matting (ISI Marked)	Jyoti Rubber Udyog/Raychem/Padmini/Dozz
ee)	AVM Pads	Dunlop/Poly Bond
ff)	MCB/Isolator/ELCB/RCCB/Distribution Board	Crompton/Havells/MDS Legrand/L&T/ Schneider Electric/Siemens/Polycab/C&S/(Make of DBs and circuit breakers shall be same)
gg)	TPN Switches & HRC Fuses	Crompton/Havells/MDS Legrand/L&T/ Schneider Electric/Siemens/Polycab/C&S/(Make of DBs and circuit breakers shall be same)
hh)	PVC Conduits (ISI Marked) Colour: Ivory/Grey	AKG/Polycab/Avon Plast/Precision/finolex/Astral
ii)	Steel Conduits (ISI Marked)	BEC/Bharat/Gupta/AKG/RMCON/Steel Krafts
jj)	Piano/Modular Switches and Sockets	Legrand/Havells/Polycab/Schneider/Anchor
kk)	Cable Tray	MEM/Bharti/Ratan/Slotco/Profab
ll)	Cable Glands	MCI, Comet/Jainson/Dowells
mm)	Thimbles/Lugs	Jainson/Dowells/Ascon
nn)	1.1 KV/11 KV grade Al. Condr., XLPE insulated armoured cables (ISI Marked)	Finolex/Havells/Polycab/KEI/Batra Henlay
oo)	Fire Survival cable	Finolex/Havells/Polycab/KEI/Batra Henlay
pp)	Wires (PVC insulated copper conductor cable FRLS – ISI marked)/ Telephone Cables/Submersible cables/ Co-axial/TV cables	Finolex/Havells/Polycab/KEI/Batra Henlay
qq)	Fans and Exhaust fans (All Types)	Khaitan / Havells/Crompton/Orient/ Bajaj/Usha/Polycab
rr)	LED Luminaries i/c street light fittings (ISI Marked)	Khaitan / Havells/Crompton/Orient /Bajaj/Usha/Polycab
ss)	LAN Cables	Panduit/Legrand/Schneider/Polycab/Batra Henlay
tt)	Centrifugal Pump	BE Power/Beacon/Crompton/ Kirloskar/KSB
uu)	Submersible Pump	BE Power/Beacon/Crompton/ Kirloskar/KSB
vv)	Motors	Crompton Greaves/Schneider Electric/Kkirloskar/ Siemens
ww)	Motor Starter	L&T/Siemens/BCH/GE Power Control/Schneider Electric
xx)	Fresh Air Fans	Khaitan/Havells/Crompton/Orient/Bajaj/Usha/Polycab
yy)	Single Phase Preventer / Overload Unit	L&T/ Minilec/Siemens
zz)	Timers	L&T/ Minilec/Siemens/AE
aaa)	Gate Valve/Foot Valve/NRV/Butter Fly Valve	Advance/Audco/Johnson Controls/Zoloto/Annapurna /Fountain/Kirloskar/Leader/Sant/Trishul/Kartar/Inter Valve

S.NO.	Material /Article	Manufacturers/ Agencies /Brand Make
bbb)	Single/Double Headed GM Landing valve	New Age (Mumbai)/Safex/Ceasefire/Padmini/Life guard
ccc)	Hydrant Valve	New Age (Mumbai)/Safex/Ceasefire/Kalpana/L&T valves Ltd. /Life guard
ddd)	Sprinkler/ Hose reel & Hose Pipe (ISI marked)	Safex/Agni/Newage/Ceasefire/Fire Guard/Omex
eee)	Fire Extinguisher (ISI marked)	Minimax/Lifeguard/Safeguard/Safex/Omex
fff)	Water Purifier	Eureka Forbes/Kent/ion Exchange /LG
ggg)	Inverter System	Sukam/Microtek/Luminous
hhh)	Electrical Water Storage Heater	Racold/Crompton/Havells/Bajaj/Polycab
iii)	Lifts	Kone / OTIS / Schindler / Johnson

9.0 PROJECT EXECUTION & SUPERVISION ASPECTS

1. The Bidder, who shall act as Contractor for the project shall be composed of qualified and experienced experts, who can carry out all the routine construction works as a fully competent and independent unit.

   However, in preparing his proposal for the construction, the Bidder should allow for a suitable mechanism which will ensure thorough co-ordination of the design and execution teams, so that each team is at all times fully aware of the remedies to common problems used by the other team.

2. The Project Head/Project Manager Representative on behalf of the Contractor should be authorized with whom day to day interactions shall be made by the Engineer-in-Charge for execution and supervision of works. He should be a senior Civil Engineer with at least 20 years of professional experience out of which 10 years in planning and construction of building works. He should have executed at least one major building work of similar in nature as proposed by the Bidder. He should be familiar with modern construction equipment and Contract conditions. The candidate should have a thorough understanding and experience with IS code relating to building construction.

3. The Bidder shall provide competent personnel for the project execution and supervision who shall be managed by the Project Head/Project Manager at site in performing the assignment under this Contract.

4. The Bidder’s personnel should have the required experience and expertise in conducting similar type of works with highest professional standards.

5. The Bidder is required to set-up the site office at the work site and make their own arrangements for the accommodation, furniture and equipment etc.

   The project execution and supervision personnel should be mobilized from the date of commencement of works by the Bidder. During the Defects Liability Period, the Bidder would be expected to provide technical advisory services on an “as required” basis.

   After award of the Contract, the Employer expects all of the proposed personnel to be available during implementation of the Contract.

6. It is the duty of the Contractor to:
    - Ensure that high quality of construction is achieved
    - Ensure that all works are carried out in full compliance with the Engineering design, technical specifications and Contract documents;
    - Check / conduct all necessary measurements, tests, and control the quality of various items of work s and in accordance with the relevant code of Building specification with the latest edition.
7. Key Personnel:

    The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in **Enclosure-I** to carry out the functions stated in the Schedule or other personnel approved by the Engineer-in-Charge. The Engineer-in-Charge will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

    If the Engineer-in-Charge asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating the reasons the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

9.1 MINIMUM SITE EQUIPMENT REQUIRED

Availability (either owned or leased having validity for the period till completion of project) of the key and critical equipment required at site as per the quantum of work will be as per **Enclosure-II.** The Bidder is to provide their own estimate of the number of equipment, commensurate with their work plan and methodology.

9.2 EQUIPMENT FOR TESTING OF MATERIALS & CONCRETE AT SITE LABORATORY

All necessary equipment for conducting necessary tests shall be provided at the site laboratory by the Bidder at his own cost as per **Enclosure-III**

9.3 INSTRUCTIONS OF ENGINEER-IN-CHARGE

The Engineer-in-Charge will, but not be limited to, the following:

- give the order to commence the works;
- inspect Contractor's plant and equipment's and recommend augmentation/ rectification of deficiencies, if required
- order special tests of materials and/or completed works, and/or order removal and substitution of improper materials and/or the works as required;
- review all the test result/ certificates of all construction materials and inspect sources of materials to establish their quality suitable to the required standard.
- check all bituminous mix designs and concrete mix design proposed by the Bidder where ever required and in due time and suggest modifications in the mix design, laying methods, sampling and testing procedure and quality control measures, to ensure required standard and consistency in quality at the commencement of times;

- check and certify the laboratory and field tests carried out by the Contractor and also carry out independent tests, if required. The report of such test shall be submitted to the Engineer-in-Charge within a period of 7 days of such tests.
- inspect the works during the construction period and the Defects Liability Period, and to issue Defects Liability Certificates after rectification by the Contractor of defects notified to him by the Engineer-in-Charge;
- check the setting out the works;
- instruct the removal from the site of materials which are not as per specifications or reconstruction of parts of the works which do not comply with the specification;
- direct to submit monthly progress reports, Quarterly progress report, Final completion Report and Bar Chart / Programme chart to complete the work in stipulated time period.
- direct to prepare Running Account Bills for works carried out by the Contractor, and certify completion of parts or the totality of the works and record of measurements in the measurement book.
- direct to send certified bill to the WAPCOS office for approval of competent authority and payment.
- direct to prepare deviation / variation (if any) with duly certified supporting documents as per the provisions in contract and will send the same to WAPCOS office for the approval of Competent Authority.

9.4 DUTIES & RESPONSIBILITIES OF THE PROJECT HEAD/PROJECT MANAGER OF CONTRACTOR

The duties of the Project Head/Project Manager of the Contractor are, to supervise construction of the works and, to test and examine any material to be used or workmanship employed in connection with the works. The principal responsibilities of the Project Head/Project Manager of the Contractor are likely to be but not limited to as follows:

- To follow the instructions given by the Engineer-in charge, Principal Employer and WAPCOS
- To prepare detailed bar chart depicting each & every activity of the work along with quantity and time bar, to complete the work in stipulated time period, which will be displayed in the Site office.
- To provide the all residential facility at site camp to the Engineer-in-Charge as per provisions
- to ensure that the construction work is accomplished in accordance with the technical specifications and Contract Conditions;
- to identify construction problems and delays and to recommend to the Engineer-in- Charge, actions to expedite progress
- to ensure proper keeping of records
- to monitor and check the day-to-day quality control and quantity measurements of the work carried out under the Contract

- to prepare in consultation with the Engineer-in-Charge, a Construction Supervision Manual outlining routine and procedures to be applied in Contract management, construction supervision and administration;
- to prepare a maintenance manual outlining the routines to be adopted in each specific reach and for the cross-drainage works and buildings;
- to comply with his contractual obligations in executing work in all matters concerning safety and care of the works (including the erection of temporary signs) and, if required, to request the Contractor to provide any necessary lights, guards, fencing and watchmen for smooth and effective working and traffic flow.
- to write a day-by-day project diary which shall record all events pertaining to the administration of the Contract, request forms and orders given to the Contractor, and any other information which may at a later date be of assistance in resolving queries which may arise concerning execution of the works;
- preparation & submission of monthly progress reports, Quarterly progress report, Final completion Report.
- Preparation, Submission & time to time revision of Bar Chart / Programme chart to complete the work in stipulated time period.
- Any other work as outlined in contract agreement, which is the responsibility of the Contractor.

9.5 DOCUMENTS PREPARED SHALL BE THE PROPERTY OF THE EMPLOYER

All plans, drawings, specifications, designs, reports and other documents (both computer hard copies and soft copies) in performing the works shall become and remain the property of the Employer, and the Contractor shall, not later than upon termination or expiration of this Contract, deliver all such documents to the Employer, together with a detailed inventory thereof. The Contractor may retain a copy of such documents but shall not use these documents for purposes unrelated to this Contract without the priory written approval of the Employer.

9.6 DETAILED IMPLEMENTATION SCHEDULE

Sl. No.	Activity / Milestones	Timeline / Date for Completion (Tentative)
1	Award of Works to Contractor	T1
2	Mobilization of the Equipment and Manpower. Conducting Soil Investigation and Topographical Survey and submisison of Report	T1 + 15 days
3	(i) Preparation of Architectural Drawings / Designs / Master Plans etc on the basis of Conceptual Drawings of the project as well as individual residential units. (ii) Preparation and submission of Structural Drawings duly vetted by the IIT. (iii) Preparation and submission of “Good For Construction” drawings for bulidngs and structures in the scope of work including internal and external Water Supply, Sewerage, electrical and Street	T1 + 2 months

Sl. No.	Activity / Milestones	Timeline / Date for Completion (Tentative)
	lighting, Internal Roads and pathways, UGR, STP and RWH etc. as per Scope of work (iv) Project preparatory Works, Site Development & Site Mobilisation Works, Physical Model of the Project, (v) Accordance of all statutory approvals (vi) The Contractor must comply to all observations, requirements and obtain all necessary approvals, Clearances, etc of Pollution Control Board/ MoEFCC/ CGWA/ Local, State & Central Government Departments/ authorities as and when required in the interest of the Project	
4	Completion of all foundation works (including Pile & Pile cap) of all buildings	T1 + 4 months
5.	Casting of Slabs, Roof Slab, activities above Roof (Water Tank etc.)	T1 + 16 months
6.	RCC Work, Brick Work / Walling Works & Plastering Works	T1 + 18 months
7.	Finishing Works (including flooring, Walling, Painting, Doors, Protective Iron/ Steel Grill etc.)	T1 + 20 months
8.	Completion & Successful Operation of all internal plumbing & Sanitary Works, Drainage System, Rain Water Harvesting system etc.	T1 + 22 months
9.	Completion & Successful Operation of all external servceis like Water Supply System with UGT and pump room, Sewerage System with STP, Storm Water System, Street Lighting etc.	T1 + 22 months
10.	Completion & successful operation of all internal electrical works, Firefighting works including Power Supply infrastructure system & other related services & works etc.	T1 + 22 months
11.	Completion & Successful Operation of all works of Utilities, Lifts, Undergrounds Tanks, Basic infrastructure, Area Lighting, Beautification Works, Landscaping Works, Paver Blocks etc. Any other related services, works, etc. as per requirement of the Project etc.	T1 + 22 months
12.	Finishing works / completion of all façade works / obtaining Completion Certificates from local bodies and WAPCOS	T1 + 22 months
13.	Handing Over and Completing all works	T1 + 24 months

Note: The work of plantation and internal services, etc. shall be completed simultaneously during the progress of work as per direction of Engineer-in-Charge.

9.7 MILESTONES TO BE ACHIEVED:

SN.	Description of Mile stone (Physical)	Time allowed (from the date of start)	Amount to be withheld on failure to achieve milestone
1	1/8th of whole of the work	3 Months	10% of 1/8th of the value of work done
2	3/8th of whole of the work	9 months	10% of 3/8th of the value of work done
3	¾th of whole of the work	18 months	10% of ¾th of the value of work done
4	Whole of the work	24 months	10% of the value of work done or Completion cost whichever is higher.

- Upon non-achievement of milestone in the allowed time, the amount equivelent to 10% of the work done shall be withheld from the subsequent RA Bills.
- In case of achievement of next Milestone, the withhold amount shall be released
- In case of faliure to the achievement of milestone, the withheld amount shall be converted to Compensation for delay (LD), if the delays attributable to the Contractor.

9.8 OTHER SITE FACILITIES

The cost of providing the work/facilities stated below are to be borne by the Contractor and shall be deemed to be included in the rate quoted by the Contractor.

- The contractor shall provide fully equipped office for Engineer-in-charge/ site engineer/ Principal Employer along with facility of 24 hours electric and drinking water supply, sanitary facilities, an inspection vehicle (with Driver, fuel, lubricants and their maintenance etc.), furniture and desktop computers of latest version along with printers and internet connection at construction site and any other miscellaneous requirement as directed by Engineer-in-charge for finalizing immediate technical solutions/decisions on the site, so that the work progress may not be hampered till the completion of Defect Liability Period. An amount equal to 1% of the gross amount of running account bills and final bill will be deducted, if above facilities are not provided at site.
- In addition to above, an amount equal to X% (As detailed below in table) of the gross amount from all the running account bills and final bill will be recovered as given below:-

Sr. No.	Project Cost	Percentage recovery (X%)
1.	Upto 5 Crores	2%
2.	Between 5 Crores to 100 Crores	1%
3.	Above 100 Crores	0.5%

- The contractor shall provide Residential accommodation at construction site for PMC Site Engineers / Inspection Teams, comprising of fully furnished rooms with attached kitchen & toilet along with full facilities of 24 hours electricity & drinking water supply.
- The contractor shall also make sufficient arrangement for Photography/ Videography preferably by maintaining a camera/ video camera at site so that video photographs.
- The Contractor shall regularly share the geotagged photographs of ongoing construction to designated what's App group. The photographs need to be shared in every stage of construction for important items and milestones like foundation reinforcement, RCC casting of foundations, columns, beams & slab, masonry work, etc. These photographs shall also be submitted as part of each Running Account Bill.
- The Contractor shall provide at his own cost, sufficient numbers of sign boards at site of approved design. The names of the Project, Employer, Consultants, Engineer and Contractor etc. shall be exhibited as directed.
- The Contractor shall make all arrangements for ground breaking ceremony/ inaugural function etc for the project as required and the cost towards it deemed to be included in his rates/offer.
- The same shall be furnished as per requirement of Monthly Progress report / Quarterly Progress Report/ Final completion report.
- The Contractor shall provide arrangements for firefighting at his own cost. For this purpose, he shall provide requisite number of fire extinguishers and adequate number of buckets, some of which are to be always kept filled with sand and some with water. This equipment shall be provided at suitable prominent and easily accessible places and shall be properly maintained. The Contractor may be subject to periodic fire prevention inspections and any deficiency or unsafe condition shall be corrected by the Contractor at his own cost and to approval of the Engineer-in-Charge and the relevant authorities.

  These fire prevention inspections shall include but not limited to the following:

  - ✓ Proper handling, storage and disposal of combustible materials, liquids and wastes.
  - ✓ Work operations which can create fire hazards.
  - ✓ Access for firefighting equipment.
  - ✓ Type, size, number and location of fire extinguishers or other firefighting equipment.
  - ✓ Inspection and maintenance records for extinguishers
  - ✓ Type, number and location of containers for the removal of surplus materials and rubbish.
  - ✓ General housekeeping
- For the purpose of quick communication between the Engineer-in-Charge and the Contractor or his Representative, Site Order Books shall be maintained at site in the manner as described below:

  Any communication, relating to the works may be conveyed through records in the

site order book. Such a communication from one party to the other shall be deemed to have been adequately served in terms of the Contract. Each site order book shall have machine- numbered pages in triplicate and shall be carefully maintained and preserved by the Contractor and shall be made available to the Engineer-in-Charge as and when demanded. Any instruction which the Engineer-in-Charge may like to issue to the Contractor may be recorded by him in the site order book and two copies thereof taken by the Engineer-in-Charge for his record. The Contractor or his Contractor or Representative may similarly record in the site order book any communication he may like to send to the Engineer-in-Charge. Two copies thereof when sent to the Engineer-in-Charge and receipt obtained thereof, will constitute adequate services of the communication to the Engineer-in-Charge.

- The Contractor shall display all permissions, licenses, registration certificates and other statements required to be displayed under various labour laws and other legislations applicable to the works at the site office and also maintain the requisite register / records factually and up to date and keep them ready for inspection by the concerned authorities and also make available the same to the Engineer-in-Charge / Owner for inspection.
- The relevant I.S. codes of practice and other relevant codes shall be of latest version with their amendments/ revisions. The Contractor shall keep and maintain copies of the latest editions of codes at the work site and make it available to Employer whenever required.
- In case of Guarantees specified for certain periods for due performance of materials and specialist items of work, the Contractor shall be a co-guarantor with the Specialist Contractor or Supplier offering such Guarantee and shall offer such co-Guarantee in a format approved by the Employer.
- The Contractor has to make own security arrangement. Contractor shall maintain upto date record of in & out of the material & labour / staff at the security gate of campus at its own expenses.
- If desired by the Employer, the Contractor shall stack and spread to the require profile the excess earth available suitable for filling in layers not exceeding 200mm, watering, consolidation within the campus and dispose of all surplus material to the nearest dumping ground/ land fill area without any additional cost, etc.
- The Employer may if require, request the assistance of Contractor labour for purpose other than from part of Contract. The Contractor will not unreasonably deny such assistance and the Engineer-in-Charge decision in this regard shall be binding on the Contractor. The Contractor will be then paid on the basis of minimum wages rates and provision made in the General Conditions of Contract.
- The Contractor shall provide safety equipment to the Employers/officers (whenever required).
- Contractor shall deploy security/ watchmen for 24 hours on site at entire execution period and up to successful handing over of the project to the PMA/SMFPL.
- Contractor shall provide safety gadgets to the Employer officers.
- Contractor shall properly cover up & protect all the work throughout the duration of work at his cost until successful handing over to the PMA/SMFPL, particularly

flooring, risers, mouldings, steps, terrace or special floor finishes (by a layer of 25 mm thick Plaster of Paris over Polyethylene sheet as approved by Engineer-in-Charge) staircases and balustrades, doors and glass, paint work, furniture and all finishing.

9.9 DRAWINGS

9.9.1 Good for Construction Drawings

The work shall be carried out in accordance with the architectural drawings, structural drawings, MEP services drawings prepared by the Contractor and approved by the PMC. Before commencement of any item of work the Contractor shall correlate all the relevant architectural and structural drawings, nomenclature of items and specifications etc. for the work and satisfy himself that the information available from there is complete and unambiguous.

On the basis of approved Drawings, the Contractor shall submit and issue the "GOOD FOR CONSTRUCTION" drawings at site. The discrepancy, if any, shall be brought to the notice before execution of the work. The Contractor alone shall be responsible for any loss or damage occurring by the commencement of work based on any erroneous and or incomplete information and no claim whatsoever shall be entertained by the department on this account.

The levels, measurements and other information concerning the existing site as shown on the conceptual / layout drawings are believed to be correct, but the Bidders should verify the same for themself and also examine the nature of the ground as no claim or allowance whatsoever shall be entertained on account of any errors or omissions and commissions in the levels or strata turning out different from what is shown on the drawings.

Two copy of contract documents including Drawings furnished to the Contractor shall be kept at the Sites and the same shall at all reasonable times be available for inspection.

9.9.2 Coordinated drawings

Before taking up the work, the Contractor shall prepare shop drawings for the works listed below for various civil and electrical services showing details of layout in plan including sections & elevations & large-scale details and Contractor shall plan and mobilize his resources as per these drawings and as per actual site conditions to facilitate convenient execution, installation as well as maintenance of these items. Nothing extra shall be payable on this account.

9.9.3 Shop drawings

The bill of quantities, technical specifications and drawings together shall be considered as a tender requirement and the work shall be carried out as per good for construction (GFC) drawings. The Contractor shall study the GFC drawings and taking into account actual site conditions and selected material and requirements shall prepare shop drawings for the following works, as fully coordinated drawings, as given above.

a. Aluminium work, Stainless steel work and railings etc.
b. Expansion joint work
c. Reflected Ceiling Plan (RCP), coordinated with all ceiling related services.
d. Marble, granite, vitreous, ceramic, tile work details.
e. All Electrical work

f. All Sanitary and sewerage work
g. All plumbing works.
h. Rainwater Pipe details/ position, roof slopes etc.
i. Drainage details.
j. Door Window details
k. All steel fabrication work.
l. Fixture, Furniture and Equipment (FFE) work.
m. Any other works detail if required.

Within the time frame agreed with the Engineer-in-Charge, the Contractor shall prepare shop drawings using latest version of AutoCAD. Shop drawings shall show all layouts, details in plans & sections showing all connections, junctions, bends, supports, clearances. fixing arrangements with dimensions room, etc shall be prepared by the Contractor on AutoCAD based on the architectural drawings and site measurements. All measurable items quantities shall be mentioned on each shop drawing being submitted for approval by the Contractor. 3 sets of shop drawings (soft copy also) shall be submitted for approval and Seven sets of final shop drawings after approval by Engineer-in-Charge shall be submitted by the Contractor along with the soft copy. The shop drawings, shall be prepared as per schedule given in PERT Chart.

Technical submittals of manufacturer's catalogues and technical data shall be submitted for approval. The Contractor shall designate an Engineer responsible for issue and preparation of shop drawings and control of GFC drawings.

9.9.4 As built drawings

i. The Contractor shall make available four (04) sets of completed Building Drawings, "As Built Drawings" along with literatures, manuals, warranty certificates etc. of various installed fittings, fixtures and equipment for the completed projects. This shall be the prerequisite for payment of final bill.

ii. The Contractor shall make available three (04) sets of all services drawings including Electrical work internal services i.e. Water Supply, Sanitary line and Drainage lines. This shall be the prerequisite for payment of final bill. These drawings shall have the following information:
    a. Run off for all piping and their diameters including soil, waste pipes and vertical stacks.
    b. Ground and invert level of all drainage pipes together with locations of all manholes and connections, up to outfall.
    c. Run off for all water supply lines with diameters location of control valves, access panels etc.

9.10 TESTING AND COMMISSIONING AND HANDOVER

- The Contractor shall arrange electricity at his own cost for testing of the various electrical and mechanical installations as directed by Engineer-in-Charge and for the consumption by the Contractor for executing the work. Also all the water required for testing various electrical installations, fire pumps, firefighting/ firefighting equipment, fire sprinklers. and testing water supply, sanitary and drainage lines, water proofing of underground sump, overhead tanks, water

proofing treatment etc. shall be arranged by the Contractor at his own cost. Nothing extra shall be payable on this account.

- Testing of equipment shall be carried out as per technical Specifications, manufacturer's recommendation and latest standards available up to date. The testing report shall be submitted along with Operation and Maintenance manual of the equipment at the time of handover.
- Contactor to provide training for operation and maintenance of equipment through respective manufacturer for the routine and preventative maintenance of equipment post Defect Liability Period.
- The Contractor shall demonstrate trouble free functioning of all the Civil and E&M installation sand services. The Engineer-in-Charge or his authorized representatives shall carry out final inspection of the various Civil and E & M services and installations. Any defect(s) noticed during demonstration shall be rectified by the Contractor at his own cost to the entire satisfaction of the Engineer-in-Charge. Nothing extra shall be payable on this account.

Enclosure-I
Desired Site Organization Structure

Minimum Level of Execution Team and Qualification/Experience of Key Staff to be deployed by the Contractor during execution of relevant works/fields is as follows:

SN.	**Designation**	**Qualification**	**Minimum Experience**	**Minimum No. Required**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling**
1	Project Manager	Graduate Engineer (Civil)	20 years	1	Rs. 1,00,000/- per month
2	Deputy Project Manager	Graduate Engineer (Civil)	15 years	3	Rs. 75,000/- per month
3	Project Engineer (Civil)	Graduate Engineer (Civil) Or Diploma Engineer (Civil)	5 years or 10 Years respectively	4	Rs. 50,000/- per month
4	Project / Site Engineer (Electrical)	Graduate Engineer (Electrical) Or Diploma Engineer (Electriccal)	5 years or 10 Years respectively	2	Rs. 50,000/- per month
5	Quality Engineer	Graduate Engineer	8 years	2	Rs. 50,000/- per month
6	Billing Engineer	Graduate Engineer (civil)	6 years	1	Rs. 50,000/- per month
7	Billing Engineer	Graduate Engineer (Elect.)	6 years	1	Rs. 50,000/- per month
8	Surveyor	Diploma Engineer	8 years	1	Rs. 30,000/- per month

Notes:

1. The bider shall submit the Detailed CV of the above Key Personnels with the Technical Bid

2. In case an bidder is proposing key professional from educational/ research institutions, a 'No Objection Certificate/ Consent Letter' from the concerned institution Consultant/Agency shall be enclosed with his CV clearly mentioning his/ her availability for the assignment. In the absence of such certificate, his/ her CV will not be evaluated.

3. Upper Age limit of any Key Expert shall be 62 years (Rejection criteria)

4. No changes shall be made in the Kep Personnel propsoed by the bidders. If, for any reason beyond the reasonable control of the Contractor, such as retirement, death, medical incapacity, among others, it becomes necessary to replace any of the Personnel, the

Contractor shall forthwith provide as a replacement a person of equivalent or better qualifications.

5. The Key Personnal shall be replaced, if the Employer
   a) finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal action, or

   b) has reasonable cause to be dissatisfied with the performance of any of the Personnel, then the agency shall, at the Employer's written request specifying the grounds therefore, forthwith provide as a replacement a person with qualifications and experience acceptable to the Employer.

   c) Any of the Personnel provided as a replacement under Clauses (a) and (b) above, does not qualify any sort of claim for additional expenditure.

Enclosure-II

Deployment of Minimum no. of Plant and Machinery by the Contractor

Whereas it is entirely the responsibility of the contractor to deploy sufficient plant and modern mechanical equipment to ensure compliance with the Contract, the following list is an indicative list of the minimum plant and machinery.

SN.	List of Plants and Machineries	Minimum nos. required
1	Batch Mix Concrete Plant with the provision of SCADA of adequate capacity at each site	1 no.
2	Field testing equipment	1 set or more as per site requirement
3	Rock Drilling Equipment	10 no. or more as per site requirement
4	Latest model of Theodolite + Levelling	1 no.
5	Total Station	1 no.
6	Truck & tipper	1 no. or more as per site requirement
7	Transit Mixer (at least 6 cubic metre capacity)	1 no. or more as per site requirement
8	Vibrator equipment (electrical & fuel type)	4 no. or more as per site requirement
9	Concrete pump of capacity at least 15 cubic metre per hour	1 no.
10	Mechanical excavator (Crawler mounted)	1 no.
11	Loader with Backhoe (tyre mounted)	1 no.
12	Minimum Steel staging & shuttering material	As per site requirement and to complete the work within schedule time period
13	Water Pumps	1 no. or more as per site requirement.
14	Compaction Roller	1 no.
15.	Tower Cranes	1 No.

Note: The Bidder shall deploy additional plant & machinery as deemed fit and required to complete the project within stipulated completion period, without any additional cost to the Employer.

Enclosure-III

Equipment for Testing of Materials & Concrete at Site Laboratory

All necessary equipment for conducting necessary tests shall be provided at the site laboratory by the Bidder at his own cost.

SN	Equipment	Quantity
1	Cube testing machine	1 No.
2	Slump Cone	2 Nos.
3	Tensile Briquette testing machine	1 No.
4	Vicats apparatus with Desk Pot	1 No.
5	Megger & earth resistance tester	4 Nos.
6	Pumps and pressure gauges for hydraulic testing of pipes	1 No.
7	Weighing scale platform type 100 kg capacity	1 No.
8	Graduated glass cylinder	As per requirement
9	Sets of sieves for coarse aggregate (40,20,10,4.75mm)	2 Nos.
10	Sets of sieves for fine aggregate [4.75; 2.36, 18; 600; 300 & 150 micron	2 Nos.
11	Core cutter for soil compaction with accessories	1 No.
12	Cube moulds size 150mm x 150mm x 150mm	30 Nos.
13	Moisture content rapid moisture meter standard	1 No.
14	Hot Air Oven Temp. Range 50^{o}C to 300^{o}C	1 No.
15	Electronic balance 600g x 0.01g. 10kg and 50kg	1 No.
16	Physical balance weight up to 5kg	1 No.
17	Digital thermometer up to 1500^{o}C	1 No.
18	Poker Thermometer (Concrete Road) 0^{o}C to 100^{o}C	1 No.
19	Measuring Jars 100ml, 200ml, 500ml	1 set of each size
20	Gauging trowels 100mm & 200mm with wooden	2 Nos.
21	Spatula 100mm & 200mm with long blade wooden handle	2 Nos. set of each size.
22	Vernier calipers 12” and 6” sizes	1 No. each
23	Digital pH meter least count 0.1pH	1 No.
24	Digital Micrometer least count 0.01mm	1 No.
25	Digital paint thickness meter for steel 500-micron range	1 No.
26	GI tray 600x450x50mm, 450x300x40mm, 300x250x40mm	1 Nos. Each
27	Electric Mortar mixer 0.25 Cum capacity	1 No.
28	Rebound hammer test Digital rebound hammer	1 No.
29	Screw gauge 0.1mm – 10mm, least count 0.05 mm	1 No.
30	Water testing Kit	1 No.
31	Aggregate impact value testing machine with blow counter	As per requirement
32	Crushing value apparatus	As per requirement
33	Thickness gauge for measuring flakiness index	As per requirement
34	Elongation gauge	As per requirement

35	Measuring Cylinder 3,5,10 & 15 litre Cylinder	As per requirement
36	Pycnometer	1 No.
37	Motorized Sieve shaker	1 No.
38	Pulse velocity Test	As per requirement
39	Bar Relocator	As per requirement

NOTE: Any other equipment for laboratory tests at site will be the way it is outlined in relevant IS Codes and / or as directed by the Employer's Representative. Quality Control Engineer shall monitor collection of Sample and conducting regular testing at site maintaining propriety and the very best standard followed in industry of construction.

All relevant IS Codes, special publications as per latest amendment/edition shall be referred.

SECTION – VIII

Technical Specifications

SECTION -VIII

TECHNICAL SPECIFICATIONS OF WORKS

1. GENERAL

Unless otherwise specified, the Work will be executed strictly in accordance with the CPWD specification corrected up to date at the time of tenders, unless specified to contrary. The specifications to be generally followed will be the following specifications and codes:

a) CPWD specification
b) BIS specification
c) National building code
d) Schedule of Quantities (SoQ) and Drawings, if any
e) Particular specification as applicable for respective works specified herein.

- Error or omission, if any in the nomenclature, rate or unit of the items or work shall be corrected as per DSR 2023.
- Measurement of work shall be done as per CPWD specifications and BIS codes, as applicable.
- Actual quantities of completed and accepted work shall only be paid.
- Nothing extra will be paid to the contractor for any lead or lift unless otherwise specified for any material required directly or indirectly under the contract.
- Nothing extra will be paid to the contractor for diverting water in the channels or streams if it becomes necessary for the execution and completion of the work.
- The contractor shall be responsible and liable for proper and complete execution of the entire work and ensure coordination and completion of Civil, Electrical, Plumbing, Mechanical/ Fire Fighting works, etc.
- Any rock extracted during excavation from site shall be recovered and the same shall be used in the random rubble masonry or for stone pitching as much as possible. However, any Royalty to be paid to the Government shall be paid by the contractor.

2. MATERIAL FOR INSTALLATION

a. The Contractor shall bring the various items & materials as per actual requirement at site at the time ofexecution of work. For any material brought prematurely at site without approval of Engineer-in- Charge, no payment shall be made for such material and the Employer shall not be responsible for its damage / deterioration. The make of material has been indicated in the tender document. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.
b. Quality of material: All materials and equipment for installation / work supplied by the Contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.
c. The Contractor shall bring the various items & materials as per actual requirement at site. Excess material more than the actual requirement shall not be accepted & paid by the Employer.

d. Before start of the work the Contractor is required to submit the shop drawings. The shop drawings shall be approved by the Engineer-in-Charge.
e. Before placing orders on the manufacturer for supply of cables, pole, fittings, pipes, etc. the contractor is required to get assessed the exact requirement of each size of the cable at site of work and get the same approved from the Engineer-in-charge. The Employer shall not take back any spare quantity of cable whether in pieces or in sealed drums/ containers, if procured more than that required at site / approved by the Engineer-in-charge.
f. However, it may be noted that the contractor shall have to arrange extra quantity of the cables, poles, fittings, pipes, etc. over and above that assessed by the contractor, before start of the work and approved by the Engineer-in-charge, if such additional quantity of the cables, poles, fittings, pipes, etc., is required at site, in order to make the installation as covered in Scope of this work and in order to make the installation operational. Such quantity shall be paid as per contractual provisions of the Agreement.

3. COMPLETENESS OF WORK

All hardware items such as screws, thimbles, G.I. wires, etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when thesame have not been specifically mentioned. All hardware materials such as nuts/ bolts/screws/ washersetc. to be used in the scheduled items shall be zinc/cadmium plated iron. Nothing extra on account of same shall be paid.

For items/equipment requiring initial inspection at manufacturer's works' the contractor will intimate the date of testing of equipment at the manufacturer's works before dispatch. The Employer also reserves the right to inspect the fabrication job at factory and the Contractor has to make thearrangement for the same. The Contractor shall give sufficient advance notice regarding the dates proposed for such tests/inspection to the Employer's representative(s) to facilitate his presence during testing/fabrication. The Engineer-in-charge at his discretion may waive off such testing/fabrication. The cost of the Engineer-in-charge's visit to the factory will be borne by the Contractor. Also, equipment may be inspected at the Manufacture's premises before dispatch to the site by the contractor.

4. CONFORMITY WITH STATUTORY ACTS, RULES, STANDARDS AND CODES

a. All components shall conform to relevant Indian Standard Specifications, International Standards andshall bear the stamp of the testing laboratory wherever existing and amended to date.
b. In respect of all labor employed directly or indirectly on the work for the execution of the work, the contractor at his own expense, will arrange for the safety provisions as per the statutory provision, BIS recommendations, factory act, and workman's compensation act, CPWD code and instructions issued from time to time. Failure to provide such safety requirements would make the Contractor liable for penalty. In addition, the Engineer-in- Charge, shall be at liberty to make arrangements and provide facilities as aforesaid and recover the cost incurred thereon from the Contractor.
c. The contractor shall provide necessary barriers, signals and other safety measures

wherever necessary so as to avoid accident. He shall also indemnify the Employer against claims for compensation arising out of negligence in this respect. Contractor shall be liable, in accordance with the Indian law and Regulations for any accident occurring due to any cause. The Employer shall not be responsible for any accident occurred or damage incurred or claims arising their form during the execution of work, the Contractor shall cover the risk. No extra payment would be made to the contractor due to the above provisions thereof.

5. CARE OF THE BUILDINGS

Care shall be taken by the contractor while handling and installing the various equipment and components of the work to avoid damages to the building/structrues. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out for the installation from the site of work.

6. PERFORMANCE GUARANTEE FOR EQUIPMENT INSTALLATION INCLUDING ELECTRICAL WORKS

The Contractor shall guarantee among other things, the following:

a) Quality, Strength and performance of the materials used.

b) Safe mechanical and electrical stress on all parts under all specified conditions of operation.

c) Satisfactory operation during the maintenance period.

7. GUARANTEE OF EQUIPMENT INSTALLATION

All equipment/ installations shall be guaranteed for a period of 2 years from the date of taking over the installation by the Employer or for the period of the manufacturer's guarantee period whichever is greater against unsatisfactory performance and/or break down due to defective design, workmanship of material. The equipment or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge.

In case it is felt by the Employer that undue delay is being caused by the contractor in doing this, the same will be got done by the Employer at the risk and cost of the contractor. The decision of the Engineer-in-Charge in this regard shall be final.

8. TRAINING, OPERATION & MAINTENANCE

Training of Owner's staff for operation and maintenance of all equipment such as Transformer, CCTVsystem, all electrical Panels/Equipment's and any other equipment shall be arranged by Contractor. Inaddition to this, the Contractor shall be required to hand over all installed equipment's manuals to the Owner.

The entire installation shall be at the risk and responsibility of the contractor until these are testedand handed over to the Employer. However, if there is any delay in construction from the Employer side, the installation may be taken over in parts, but the decision on the same

shall rest with Engineer-in Charge which shall be a binding on the contractor.

9. POWER SUPPLY

Electrical power/Alternate source including backup power supply (as and when required) shall be arranged by the contractor for Construction, installation purpose at his own cost and payment for electricity charges shall be made by contractor. Electrical power supply required for testing of entire installation after completion shall be arranged by the Contractor.

10. DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE CONTRACTOR

The Contractor would be required to submit the followings for approval before commencement of installation.

a. Technical submittal/catalogue/brochures of all equipment's installations to Engineer-In-Charge. Only after approval of such approval, the Contractor should place order for equipment and bring it to site.

b. Any other drawing/information not specifically/mentioned above but deemed to be necessary for the job by the contractor.

11. COMPLETION PLAN & TEST CERTIFICATE FOR EQUIPMENT INSTALLATIONS INCLUDING ELECTRICAL

The layout of all the installation for all services with proper dimensions, shall be finalized in consultation with the Engineer-in-Charge or his representative and the layout shall be got approved by the Engineer-in-Charge before start of the work.

Contractor shall submit completion plan/ Electrical drawings in triplicate before finalisation of bill.

12. VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:

The materials shall be procured only from the manufacturers and their authorized dealers and documentary proof for such procurement and supply shall be produced by the contractor as required by Engineer-in-charge. The contractorshall have to produce all the relevant records to certify that the genuine equipment from the manufacturers has been supplied and erected. The Employer reserves the right to send such materials to the manufacturers / authorized test laboratory to verify the genuineness and quality of the product. The Contractor shall submit all documentary details in fulfillment of this of invoices, test certificates; gate passes etc. to prove the genuineness of material/purchases from manufacturer or authorized dealerswhich are used at site as per agreement.

13. PAINTING:

All equipment works shall be painted at the workshops/factory/manufacturing unit before dispatch to the site. Care shall be taken by the contractor while handling and installing the various equipment and components of the work to avoid damage to the finishes of equipment. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out for the installation from the site of work.

14. MAINTENANCE DURING DEFECT LIABILITY PERIOD

Sufficient trained and experienced staff shall be made available to meet any exigency of work attends the complaint during the defect liability period from the handing over of the project.

The contractor shall ensure that all the skilled persons managed / deployed for executing the electrical work possess wireman license issued by approved authorities, otherwise he will not be permitted to execute the work. Also, consequences arising due to the default of the contractor to comply with this condition would be contractor's responsibility only.

15. SPECIFICATIONS OF BUILDINGS / STRUCTURES

15.1 Specifications of Admin Block / Training Block & Offices

S.No.	Description	Specifications
1.0	FOUNDATION	
1.1	For RCC framed structure	Pile Foundation with pile cap
2.0	SUPER STRUCTURE	
2.1	For RCC framed structure	R.C.C. framed construction having filler walls with fly ash bricks/ Aerated cement concrete (ACC) blocks / autoclaved aerated cement (AAC) blocks.
2.3	Internal partitions	Aerated cement concrete (ACC) blocks./ Light weight autoclaved aerated concrete (AAC) / Fly ash bricks.
2.4	Sunken Floor in Lavatory Blocks for Floor Traps/ W.C. with four course waterproofing treatment	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done by false ceiling as per the architectural drawings.
3.0	DOORS & WINDOWS	
3.1	Frames	
3.1.1	Door Frames	Door frames of anodized/ powder coated/ polyester powder coated aluminium extruded tubular sections/ extruded hollow mild steel pipes (minimum 2 mm thickness)/ uPVC extruded frame sections/ WPC of density between 750 to 1000 kg per cum.
3.1.2	Window Frame:	uPVC extruded sections of window frame/ Aluminum extruded tubular sections / WPC of density between 750 to 1000 kg per cum.
3.2	Door & Window Shutters	
3.2.1	Door Shutter	Paneled type in 2nd class Teak wood or flush door shutters with teak veneered ply/ commercial ply or anodized/ powder coated/ polyester powder coated aluminum shutters with toughened glass glazing/ paneling wherever required as per CPWD specifications/as per design & drawing.
3.2.3	Frame and shutters in wet area	PVC/FRP/WPC door frames & shutters in wet areas.
3.3	Window shutters	Factory made colour anodized/ powder coated/ polyester powder coated Z-section aluminum shutters/ standard uPVC/WPC section for windows glazed with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement.

S.No.	Description	Specifications
3.4	Fittings	Stainless steel SS-304 grade.
3.5	Fire check door	As per fire safety specifications.
4.0	FLOORING	
4.1	Main Entrance Hall	18 mm thick Pre polished granite flooring.
4.2	Corridors	Matt finished vitrified tiles / granite flooring
4.3	Rooms	Granite tiles/ vitrified tiles/ engineered wood flooring (in officers chambers)
4.4	Lavatory / Toilets Blocks	Granite flooring
4.7	Rest of the area	Vitrified ceramic floor tiles
5.0	STAIRCASE	
5.1	Internal Staircases	18 mm thick single piece granite stone in flooring in treads & risers with dado of matching permanent finish specifications.
5.2	Fire escape staircase	18 mm thick flamed granite in single piece in treads & risers with dado of matching permanent finish specifications.
6.0	RAILING	Stainless steel balustrades with 12mm thick toughened glass railing or stainless steel tubular horizontal guard rails /hand rails in SS-304 grade.
7.0	TOILETS	Glazed tiles of size not less than 300 x 450 mm/ 400 x 600 mm in dado upto ceiling height, granite counters, rimless counter sunk basins/stainless steel sinks, mirrors with moulded PVC frame, FRP/PVC doors with frames.
8.0	ROOFING	
8.1	Roof Treatment	Coba treatment/over deck insulation with puff slab.
8.2	False ceiling	False ceiling in office area & toilets to cover the services as per design requirements.
9.0	FINISHING	
9.1	External	Dry stone cladding/washed stone grit plaster/ water proof weather coat paints/ structural glazing/ ACP cladding conforming to Energy Conservation Building Code.
9.2	Internal	Cement plaster in wet areas/ Dry acrylic paint/ distemper in service area & basement/ Acrylic emulsion paint/ textured paint (low V.O.C) over POP/ Wall paneling as per approved architectural design upto sill level/ 1200 mm height or ceiling height
9.3	Painting	Doors & windows - painting/ polishing on wood work as per design requirement.
10.0	Provision for barrier free building	Ramps, toilets for physically challenged, chequered tiles, use of Braille signage etc. GRC (glass reinforced concrete) tiles in ramp area.
11.0	VRV/VRF	As per Requirement
12.0	Storey Height	AS per DPAR 2023
13.0	Plinth Height	900mm above FGL

15.2 Specifications of 1 No. 128 Men Barrack

S.No.	ITEM	Specification
1	**Foundation**	
a)	Foundation	Pile Foundation with Pile Cap
2	**Superstructure**	
a)	For multi-storey RCC framed structure	RCC frame & filler walls of autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
b)	Internal partition	Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
c)	Toilet floor slab	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done be false ceiling as per the architectural drawings.
3	**Doors and Windows**	
a	Frames (except of toilet/bath & WC)	
	i) Door	Seamless mild steel tubular frame (with Hot Dip GI Coating) with minimum wall thickness of 2.0 mm. The external entrance door frame will have double rebate or sub frame for double doors i.e. main door and safety grill door with SS 304 wire (Powder Coated) mesh. For internal doors single rebate frames.
	ii) Window	uPVC extruded frame sections with minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular sections/ engineered wood sections along with the provision of sub frame of suitable material.
	iii) Doors & windows of toilet/ bath/ WC	uPVC extruded frame sections with wall thickness minimum 1.7 mm/ FRP/ PVC, compatible to doors shutters
b	Shutters	
	i) Main door/ external door shutters	Double shutters, one mild steel (Hot Dip Galvanized) grill door with mosquito proof stainless steel wire mesh of SS-304 grade (Powder Coated), painted and other 35 mm thick factory made flush door shutter having decorative veneering on both side with melamine polish.
	ii) Bath, WC& toilet door	25 to 30 mm thick, FRP/ PVC panelled doors
	iii) Other doors	35 mm thick, Chemically Treated Hard wood styles and rails with 12 mm thick commercial ply/ wood paneling or factory made flush door shutters both side commercial ply veneering and finished with wooden Putty and painted.
c)	Window shutters All windows shutters	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of

S.No.	ITEM	Specification
		minimum wall thickness of 1.7 mm with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement and other shutter with stainless steel SS-304 grade wire-mesh in place of glazing.
d)	Hardware & Fittings Main units	Powder coated or colour anodized aluminum stainless steel fittings SS-304 grade.
4	**Flooring, Skirting & DADO**	
a)	Flooring Living/ drawing room, dining & family lounge	Vitrified tile flooring of size not more than 600 x 600 mm
b)	Bedrooms	Vitrified tile flooring of size not more than 600 x 600 mm with joints finished with matching grout.
c)	Kitchen	Anti-skid vitrified tiles of size not more than 600 x 600 mm with water absorption less than 0.08% laid with joints finished with matching grout
d)	Kitchen counter	18 mm thick pre-polished granite with nosing as per design
e)	Common circulation area	18 mm thick pre-polished granite/ vitrified tiles in all designs and shades (with water absorption less than 0.08%) of any size.
f)	Main Staircase/ Fire Escape Staircase	18 mm thick honed/ flamed finish granite in single length of treads & risers
g)	Toilets/ bathroom/ WC	Glazed ceramic anti- skid of size not more than 300 x 300 mm. including grouting the joints.
h)	Skirting in rooms and other areas	100 to 150 mm high skirting matching the floor material.
i)	Kitchen dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor upto full height.
j)	Toilets/ bathrooms/ WC dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.
5	**RAILINGS/ PARAPETS IN BALCONIES/ TERRACE**	
a)	Railings in balconies	Clear 1.00 m high Stainless Steel railing made out of tubular balustrades with horizontal tubular SS tubes as rails and hand rail on top (as per approved design); all stainless steel tubular members to be on SS-316 L grade.
	Note: Hand rail of the balcony railings in multi storey flats may be so designed that clothes drying lines in sufficient numbers are provided along with	
b)	Parapet on terrace	200/ 230 mm thick masonry in autoclaved aerated cement concrete (ACC) blocks/ RCC/ burnt clay FPS

S.No.	ITEM	Specification
		bricks duly plastered on both sides and top upto 1.0 meter clear height
6.	**FINISHES**	
a)	Internal finishes	All walls & ceiling to be treated with 2 mm thick POP (one time only) and painted with low VOC acrylic washable distemper. Synthetic enamel paint on all wood works and steel works
b)	External finishes	Quartz reinforced texture acrylic paint finish/ Premium acrylic smooth water proof exterior finish over cement-based putty/ washed mosaic plaster in premium cement. Synthetic enamel paint on all wood work & steel work
7.0	Storey Height	3.30m
8.0	Plinth Height	900mm above FGL

15.3 Specifications of Type-II & Type-III Residential Quarters

S.No.	ITEM	Specification
1	**Foundation**	
a)	Foundation	Pile Foundation with Pile Cap
2	**Superstructure**	
a)	For multi-storey RCC framed structure	RCC frame & filler walls of autoclaved aerated cement concrete (ACC) blocks/ fly ash bricks.
b)	Internal partition	Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks/ fly ash bricks.
c)	Toilet floor slab	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done be false ceiling as per the architectural drawings.
3	**Doors and Windows**	
a	Frames (except of toilet / bath & WC)	
	i) Door	Seamless mild steel tubular frame (with Hot Dip GI Coating) with minimum wall thickness of 2.0 mm. The external entrance door frame will have double rebate or sub frame for double doors i.e. main door and safety grill door with SS 304 wire (Powder Coated) mesh. For internal doors single rebate frames.
	ii) Window	uPVC extruded frame sections with minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular sections/ engineered wood sections along with the provision of sub frame of suitable material.
	iii) Doors & windows of toilet/ bath/ WC	uPVC extruded frame sections with wall thickness minimum 1.7 mm/ FRP/ PVC, compatible to doors shutters
b	Shutters	
	i) Main door/ external door shutters	Double shutters, one mild steel (Hot Dip Galvanized) grill door with mosquito proof stainless steel wire mesh of SS-304 grade (Powder Coated), painted and other

S.No.	ITEM	Specification
		35 mm thick factory made flush door shutter both side commercial veneered and painted. (including necessary lipping).
	ii) Bath, WC& toilet door	25 to 30 mm thick, FRP/ PVC panelled doors
	iii) Other doors	35 mm thick, Chemically Treated Hard wood styles and rails with 12 mm thick commercial ply/ wood paneling or factory made flush door shutters both side commercial ply veneering and finished with wooden Putty and painted.
c)	Window shutters All windows shutters	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of minimum wall thickness of 1.7 mm with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement and other shutter with stainless steel SS-304 grade wire-mesh in place of glazing.
d)	Hardware & Fittings Main units	Powder coated or colour anodized aluminum stainless steel fittings SS-304 grade.
4	**Flooring, Skirting & DADO**	
a)	Flooring Living/ drawing room, dining & family lounge	Vitrified tile flooring of size not more than 600 x 600 mm
b)	Bedrooms	Vitrified tile flooring of size not more than 600 x 600 mm with joints finished with matching grout.
c)	Kitchen	Anti-skid vitrified tiles of size not less than 600 x 600 mm with water absorption less than 0.08% laid with joints finished with matching grout
d)	Kitchen counter	18 mm thick pre-polished granite with nosing as per design
e)	Common circulation area	18 mm thick pre-polished granite/ vitrified tiles in all designs and shades (with water absorption less than 0.08%) of any size.
f)	Main Staircase	18 mm thick honed/ flamed finish granite in single length of treads & risers
g)	Toilets/ bathroom/ WC	Glazed ceramic anti- skid of size not more than 300 x 300 mm. including grouting the joints.
h)	Skirting in rooms and other areas	100 to 150 mm high skirting matching the floor material.
i)	Kitchen dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor upto full height.
j)	Toilets/ bathrooms/ WC dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.
5	**RAILINGS/ PARAPETS IN BALCONIES/ TERRACE**	
a)	Railings in balconies	Clear 1.00 m high MS railing made out of MS flats and square bars with 40 mm dia MS pipe hand rail on top (as per approved design)
	Note: Hand rail of the balcony railings in multi storey flats may be so designed that clothes drying lines in sufficient numbers are provided along with	

S.No.	ITEM	Specification
b)	Parapet on terrace	200/ 230 mm thick masonry in autoclaved aerated cement concrete (ACC) blocks/ RCC/ burnt clay FPS bricks duly plastered on both sides and top upto 1.0 metre clear height
6	**FINISHES**	
a)	Internal finishes	All walls & ceiling to be treated with 2 mm thick POP (one time only) and painted with low VOC acrylic washable distemper. Synthetic enamel paint on all wood works and steel works
b)	External finishes	Quartz reinforced texture acrylic paint finish/ Premium acrylic smooth water proof exterior finish over cement-based putty/ washed mosaic plaster in premium cement. Synthetic enamel paint on all wood work & steel work
7.0	Storey Height	As per DPAR 2023
8.0	Plinth Height	900mm above FGL

15.4 Specifications of Type-IV Residential Quarters

S.No.	ITEM	Specification
1	**Foundation**	
a)	Foundation	Pile Foundation with Pile Cap
2	**Superstructure**	
a)	For multi-storey RCC framed structure	RCC frame & filler walls of autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
b)	Internal partition	Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
c)	Toilet floor slab	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done be false ceiling as per the architectural drawings.
3	**Doors and Windows**	
a	Frames (except of toilet/bath & WC)	
	i) Door	Seamless mild steel tubular frame (with Hot Dip GI Coating) with minimum wall thickness of 2.0 mm. The external entrance door frame will have double rebate or sub frame for double doors i.e. main door and safety grill door with SS 304 wire (Powder Coated) mesh. For internal doors single rebate frames.
	ii) Window	uPVC extruded frame sections with minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular sections/ engineered wood sections along with the provision of sub frame of suitable material.
	iii) Doors & windows of toilet/ bath/ WC	uPVC extruded frame sections with wall thickness minimum 1.7 mm/ FRP/ PVC, compatible to doors shutters
b	Shutters	

S.No.	ITEM	Specification
	i) Main door/ external door shutters	Double shutters, one mild steel (Hot Dip Galvanized) grill door with mosquito proof stainless steel wire mesh of SS-304 grade (Powder Coated), painted and other 35 mm thick factory made flush door shutter having decorative veneering on both side with melamine polish.
	ii) Bath, WC& toilet door	25 to 30 mm thick, FRP/ PVC panelled doors
	iii) Other doors	35 mm thick, Chemically Treated Hard wood styles and rails with 12 mm thick commercial ply/ wood paneling or factory made flush door shutters both side commercial ply veneering and finished with wooden Putty and painted.
c)	Window shutters All windows shutters	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of minimum wall thickness of 1.7 mm with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement and other shutter with stainless steel SS-304 grade wire-mesh in place of glazing.
d)	Hardware & Fittings Main units	Powder coated or colour anodized aluminum stainless steel fittings SS-304 grade.
4	**Flooring, Skirting & DADO**	
a)	Flooring Living/ drawing room, dining & family lounge	Vitrified tile flooring of size not more than 600 x 600 mm
b)	Bedrooms	Vitrified tile flooring of size not more than 600 x 600 mm with joints finished with matching grout.
c)	Kitchen	Anti-skid vitrified tiles of size not more than 600 x 600 mm with water absorption less than 0.08% laid with joints finished with matching grout
d)	Kitchen counter	18 mm thick pre-polished granite with nosing as per design
e)	Common circulation area	18 mm thick pre-polished granite/ vitrified tiles in all designs and shades (with water absorption less than 0.08%) of any size.
f)	Main Staircase/ Fire Escape Staircase	18 mm thick honed/ flamed finish granite in single length of treads & risers
g)	Toilets/ bathroom/ WC	Glazed ceramic anti- skid of size not more than 300 x 300 mm. including grouting the joints.
h)	Skirting in rooms and other areas	100 to 150 mm high skirting matching the floor material.
i)	Kitchen dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor upto full height.
j)	Toilets/ bathrooms/ WC dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.

S.No.	ITEM	Specification
5	**RAILINGS/ PARAPETS IN BALCONIES/ TERRACE**	
a)	Railings in balconies	Clear 1.00 m high Stainless Steel railing made out of tubular balustrades with horizontal tubular SS tubes as rails and hand rail on top (as per approved design); all stainless steel tubular members to be on SS-316 L grade.
	Note: Hand rail of the balcony railings in multi storey flats may be so designed that clothes drying lines in sufficient numbers are provided along with	
b)	Parapet on terrace	200/ 230 mm thick masonry in autoclaved aerated cement concrete (ACC) blocks/ RCC/ burnt clay FPS bricks duly plastered on both sides and top upto 1.0 meter clear height
6.	**FINISHES**	
a)	Internal finishes	All walls & ceiling to be treated with 2 mm thick POP (one time only) and painted with low VOC acrylic washable distemper. Synthetic enamel paint on all wood works and steel works
b)	External finishes	Quartz reinforced texture acrylic paint finish/ Premium acrylic smooth water proof exterior finish over cement-based putty/ washed mosaic plaster in premium cement. Synthetic enamel paint on all wood work & steel work
7.0	Storey Height	As per DPAR 2023
8.0	Plinth Height	900mm above FGL

15.5 Specifications of Type-V Residential Quarters

S.No.	ITEM	Specification
1	**Foundation**	
a)	Foundation	Pile Foundation
2	**Superstructure**	
a)	For multi-storey RCC framed structure	RCC frame & filler walls of autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
b)	Internal partition	Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks / fly ash bricks.
c)	Toilet floor slab	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done be false ceiling as per the architectural drawings.
3	**Doors and Windows**	
a	Frames (except of toilet/bath & WC)	

S.No.	ITEM	Specification
	i) Door	Seamless mild steel tubular frame (with Hot Dip GI Coating) with minimum wall thickness of 2.0 mm. The external entrance door frame will have double rebate or sub frame for double doors i.e. main door and safety grill door with SS 304 wire (Powder Coated) mesh. For internal doors single rebate frames.
	ii) Window	uPVC extruded frame sections with minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular sections/ engineered wood sections along with the provision of sub frame of suitable material.
	iii) Doors & windows of toilet/ bath/ WC	uPVC extruded frame sections with wall thickness minimum 1.7 mm/ FRP/ PVC, compatible to doors shutters
b	Shutters	
	i) Main door/ external door shutters	Double shutters, one safety grill single/ double leaf door in SS-304 L grade frame with mosquito proof stainless steel wire-mesh of stainless steel-304 grade (Powder coated) and stainless steel fittings and other with 35mm thick factory made exterior grade both side decorative veneered type flush door shutter with melamine polish. (including necessary lipping)
	ii) Bath, WC& toilet door	25 to 30 mm thick WPC of density 650 kg per cum paneled/ 30 to 35 mm thick flush doors.
	iii) Other doors	35 mm thick, Chemically Treated Hard wood styles and rails with paneling of 12 mm thick teak ply/ teak wood/ 5 mm thick toughened glass glazing or 35 mm thick factory made exterior grade both side decorative veneered type flush door shutter with melamine polish.
c)	Window shutters All windows shutters	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of minimum wall thickness of 1.7 mm/30 mm thick 2nd class teak wood with glazing of float/ toughened glass and with/ without reflective coating/ high performance coating or double glazed unit as per design & requirement and other with stainless steel SS-304 grade wire-mesh in place of glazing.
d)	Hardware & Fittings Main units	Powder coated or colour anodized aluminum stainless steel fittings SS-304 grade.
4	**Flooring, Skirting & DADO**	
a)	Flooring Living/ drawing room, dining & family lounge	18 mm thick pre-polished granite stone of approved shade/ vitrified tile (in all designs and shades) of any size. Flooring of living/ drawing room can also have

S.No.	ITEM	Specification
		scratch resistant engineered wood or laminated wooden flooring.
b)	Bedrooms	18 mm thick pre-polished granite stone of approved shade/ vitrified tile (in all designs and shades) of any size/ scratch resistant engineered wood or laminated wooden flooring.
c)	Kitchen	Anti-skid vitrified tiles of size not more than 600 x 600 mm with water absorption less than 0.08% laid with joints finished with matching grout
d)	Kitchen counter	18 mm thick pre-polished granite with nosing as per design
e)	Common circulation area	18 mm thick pre-polished granite/ vitrified tiles in all designs and shades (with water absorption less than 0.08%) of any size.
f)	Common circulation area in domestic help's quarters	18 mm thick granite stone/ locally available stone
g)	Main Staircase/ Fire Escape Staircase	18 mm thick honed/ flamed finish granite in single length of treads & risers
h)	Toilets/ bathroom/ WC	Rectified ceramic anti-skid tiles of size not more than 300 x 300 mm
i)	Skirting in rooms and other areas	100 to 150 mm high skirting matching the floor material.
j)	Kitchen dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor to full height.
k)	Toilets/ bathrooms/ WC dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.
5	**RAILINGS/ PARAPETS IN BALCONIES/ TERRACE**	
a)	Railings in balconies	Clear 1.00 m high Stainless Steel railing made out of tubular balustrades with horizontal tubular SS tubes as rails and hand rail on top (as per approved design); all stainless steel tubular members to be on SS-316 L grade.
	Note: Hand rail of the balcony railings in multi storey flats may be so designed that clothes drying lines in sufficient numbers are provided along with	
b)	Parapet on terrace	200/ 230 mm thick masonry in autoclaved aerated cement concrete (ACC) blocks/ RCC/ burnt clay FPS bricks duly plastered on both sides and top upto 1.0 meter clear height
6.	**FINISHES**	
a)	Internal finishes	All walls & ceiling to be treated with 6 mm thick POP punning (one time only) and painted with low VOC

S.No.	ITEM	Specification
		plastic emulsion paint. Synthetic enamel paint on all wood works and steel works
b)	External finishes	Quartz reinforced texture acrylic paint finish of approved shade/ premium acrylic smooth water proof exterior finish/ washed mosaic plaster in premium cement-based putty/ exposed brick/ stone work/ GRC/ designer cement concrete tile cladding/ ACP cladding in combination with structural glazing
7.0	Storey Height	As per DPAR 2023
8.0	Plinth Height	900mm above FGL

15.6 Specifications for Development works:

S. No.	NAME OF WORK	DETAILS
1	**Internal Roads, Paths and Culverts:**	
a)	Internal roads	(i) Road width as per drawing (ii) Road shall be constructed as shown in the drawings (iii) Cement concrete pavement with vacuum dewatered concrete
b)	Pathways:	(i) Width as per requirement and Design (ii) Pathways shall be provided to connect the buildings/ permanent infrastructure to nearby internal roads. (iii) Pathways with PCC base, 60 mm thick paver blocks and kerb stone edging
c)	Culverts	As per actual requirement. The Culverts shall be designed in such a way that no natural flow of stream/ nalla / channel / canal etc. shall be obstructed.
d)	Raising of Ground level around proposed Roads, Buildings & Boundary Wall etc. inside the Campus	Filling with Good Earth, levelling and compacting to raise the existing Ground Level to the nearest highest existing metal road level. Area to be filled & levelled is approximately 35613 sqm.
2	**External water supply**	
a)	Tube/ open well including submersible pumps (preferably Solar Powered) & cabling etc. complete	Shall be executed as per availability of underground water after examination by the local PHED or any other elated Govt, agencies.
b)	Under Ground Sump	One day Storage capacity with 2 nos. centrifugal mono block pumps (1W + 1S) with panels and all allied works

S. No.	NAME OF WORK	DETAILS
c)	Pump Room	i. Plinth area- As per requirement ii. Floor height - As per requirement iii. Building shall be RCC framed structure and shall be executed over Under Ground Water Tank. iv. Flooring -CC v. Internal Painting- White Wash vi. Door- Laminated Machine Pressed Flush Door vii. Window - Steel Glazed Door with wire mesh shutters
d)	Water filtration plant (if required)	Shall be executed if required, after conducting necessary water test through Govt. agencies or NABL accredited agency.
e)	Water supply distribution line	GI Pipes from bore well to UGT. Distribution line shall be designed as per the rquirement of buildings. All pipes shall be GI/cPVC only as per requirement.
3	**External Electrification:**	
a)	Substation building	(i) Plinth area- As per requirement (ii) Floor height - As per requirement (iii) Building shall RCC framed structure. (iv) Flooring -CC (v) Internal Painting- White Wash (vi) Door- Laminated Machine Pressed Flush Door (vii) Window - Steel Glazed Door (viii) Rolling Shutters as per requirement
b)	LT / HT Panel	Fabricated from CPRI approved workshop
c)	External wiring/cable connection using U.G. cables from sub-station to feeder pillar, building & pump house and necessary connection from DG set to infrastructures.	The capacity of sub-station shall be 500 kVA.
d)	Sub-Station Equipments	Supplying, installation, testing and commissioning of 33 kV/ 0.433 kV or 11 kVA kV/ 0.433 kV substation equipment comprising HT panel, dry type/ Oil type transformers, HT cable, bus trunking from transformer to LT panel, LT panels, automatic power factor correction panel, active harmonic filters, TVSS (transient voltage suppression system), SPD (surge protection system), essential panel, earthing, required inter-connections, substation safety equipments including LT cabling from substation to the buildings

S. No.	NAME OF WORK	DETAILS
		fed by the substation.
5	**External sewerage System**	
a)	Sewage Treatment Plants (STP) with all E&M Equipments	(i) Proper planning shall be made before the selection of suitable technology of STP to be adopted. (ii) STP shall be designed as per the user and as per CPWD specification. (iii) Sufficient soak pit or dispersion channels shall be provided as per the soil condition
b)	External sewerage line	Proper planning shall be made before execution and shall be approved by Engineer-In-Charge
6	**DG Sets**	(i) Shall confom to the latest norms of Govt. of India (ii) As pre requirement, DG Set Capacity is 300 kVA. (iii) Including erection, installation, testing, commissioning etc. (iv) Essential connection to various building shall be provided as perlatest guideline/ order.
8	**Retaining wall / Breast wall (if required)**	Proper planning shall be made before execution and shall be approved by Engineer-In-Charge
9	**Strom Water Drain**	(i) Proper planning shall be made after examining the levels of the campus very carefully before preparation of Preliminary estimate. Rain water pipe collect from the buildings shall be connected with the campus storm water drain. (ii) Road side drain shall be avoided (iii) Level of outfall drains shall always kept higher than the highest water level of Nallah/Natural drainage where water will be disposed off finally.
10	**Rain water harvesting**	Proper planning shall be made before execution and shall be approved by Engineer-In-Charge
11	**Boundary Wall including Main Gate and Guard Room:**	
A	Boundary wall	(i) Boundary wall with 2100 mm high wall and 600 mm high fencing with Concertina wire over wall (ii) The boundary wall shall be of RCC columns, plinth beam, top band and filler wall in ACC Block /CC Blocks / Flyash Bricks.
B	Guard Room	(i) Plinth area- As per requirement. (ii) Floor height - As per requirement. (iii) Building shall RCC framed structure with slope roof. (iv) Other specification as per Annexure-V of PAR-19

S. No.	NAME OF WORK	DETAILS
		for Type-I qtrs.
C	Main Gate – As per Layout Plant	(i) Width & Height of Main Gate: As per drawing approved by the WAPCOS. (ii) Wicket Gate: As per drawing approved by the WAPCOS.
12	**Street Lighting**	
A	**Street Lighting with LED**	Supplying, installation, testing and commissioning of LED street/ compound/ high mast/ pathway/ landscape lighting for the entire campus. The Street lighting shall be provided with Solar lights in addition to normal LED street lighting.
13	**Solar Photo Voltaic Power Generation System of 60 kWP capacity**	Supplying, installation, testing and commissioning of grid interactive roof top solar photo voltaic power generation system including space frame
14	**CCTV System**	Supplying, installation, testing and commissioning of IP based CCTV System for building security comprising of PTZ/fixed camera, cabling, digital recording, HD display system with minimum display of 5" x 8" per camera and hard ware software support – Area to be covered is 8000 sqm (approximately)
15	**Boom Barrier**	Electromechanical Boom Barrier with all accessories at Main Entry and Exit Gate – 2nos.

16. PLUMBING WORKS

16.1 General requirements

The form of Contract shall be according to the "Conditions of Contract". The following clauses shall be considered as an extension and not in limitation of the obligation of the Contractor.

Work under this contract shall consist of furnishing all labour, materials, equipment and appliances necessary and required. The Contractor is required to completely furnish all the Plumbing and other specialized services as described hereinafter and as specified in the Schedule of Quantities and/or shown on the Plumbing Drawings.

Without restricting to the generally of the foregoing, the sanitary installations shall include the following Plumbing Works

a. Sanitary ware Installation

b. Water Supply System (Hot & Cold).

c. Underground water tanks with all sleeves.

d. Sewerage & Storm water drainage system.

16.2 Specifications

Work under this contract shall be carried out strictly in accordance with Specifications attached with the tender and as per requirement, CPWD specifications with upto date amendments, relevant IS standards and in case of its absence as per British Standard Code of Practice.

16.3 Execution of Work

a) The work shall be carried out in conformity with the Plumbing drawings and within the requirements of Architectural, Mechanical, Electrical, Structural and Other specialized services drawings as shall beshared subsequently.

b) The Contractor shall cooperate with all trades and agencies working on the site. He shall make provision for hangers, sleeves, structural openings and other requirements well in advance to prevent hold up of progress of the construction schedule.

16.4 Drawings

i. Plumbing drawings that shall be issued to Successful Bidder shall be diagrammatic but shall be followed as closely as actual construction permits. Any deviations made shall be in conformity with the Architectural and other services drawings.

ii. Architectural drawings shall take precedence over Plumbing or other services drawings as to all dimensions

iii. Contractor shall verify all dimensions at site and bring to the notice of the Engineer-in-Charge all discrepancies or deviations noticed. Decision of the Engineer-in-Charge shall be final.

iv. Large size details and manufacturers dimensions for materials to be incorporated shall take precedenceover small scale drawings.

16.5 Inspection and Testing of Materials

Contractor shall be required, if requested, to produce Manufacturers Test Certificate for the particular batch of materials supplied to him. The tests carried out shall be as per the relevant Indian Standards.

For examination and testing of materials and works at the site Contractor shall provide all Testing andGauging Equipment necessary but not limited to the followings: -

i. Theodolite, Steel tapes
ii. Dumpy level
iii. Weighing machine
iv. Plumb bobs, Spirit levels, Hammers
v. Micrometers, Tachometers
vi. Thermometers, Stoves
vii. Hydraulic test machine

viii. Smoke test machine

All such equipment shall be tested for calibration at any NABL accredited laboratory, if required by the Engineer-in-Charge

All Testing Equipment shall be preferably located in a special room meant for the purpose.

Samples of all materials shall be got approved before placing order and the approved samples shall bedeposited with the Engineer-in-Charge or kept at site in a sample room as prepared by the Engineer-in-Charge. Any materials declared defective Engineer-in-Charge shall be removed from the site within 48 hours.

16.6 Reference Drawings

The Contractor shall maintain one set of all drawings issued to him as reference drawings.

All corrections, deviations and changes made on the site shall be shown on these reference drawings for final incorporation in the completion drawings. All changes to be made shall be initialed by the Engineer-in-Charge.

16.7 Shop Drawings

The Contractor shall submit to the Engineer-in-Charge the shop drawings under following conditions:

i. Showing any changes in layout in the plumbing drawings.
ii. Equipment layout, piping and wiring diagram.
iii. Manufacturers or Contractor's fabrication drawings for any materials or equipment supplied by him.

The Contractor shall submit two copies of catalogues, manufacturer's drawings, equipment characteristics data or performance charts as required by the Engineer-in-Charge.

16.8 As built Drawings

On completion of work, Contractor shall submit two prints of "as built" drawings to the Engineer-in- Charge. These drawings shall have the following information.

(a) Run of all piping, diameters on all floors, vertical stacks and location of external services.

(b) Ground and invert levels of all drainage pipes together with location of all manholes and connectionsupto outfall

(c) Run of all water supply lines with diameters, locations of control valves, access panels.

(d) Location of all mechanical equipment with layout and piping connections.

No completion certificate shall be issued unless the above drawings are submitted. Contractor shall provide two sets of catalogues, service manuals manufacturer's drawings, performance data and list ofspare parts together with the name and address of the manufacturer for all electrical and mechanical equipment provided by him.

16.9 Testing

Piping and drainage works shall be tested as specified under the relevant clause(s) of the specifications.Tests shall be performed in the presence of the Engineer-in-Charge.

All materials and equipment found defective shall be replaced and whole work tested to meet the requirements of the specifications.

Contractor shall perform all such tests as may be necessary and required by the local authorities to meetMunicipal or other bye-laws in force.

Contractor shall provide all labour, equipment and materials for the performance of the tests.

16.10 Cutting of Water Proofing Membrane

No walls, terraces shall be cut for making and opening after water proofing has been done without written approval of Engineer-in-Charge.

16.11 Cutting of Structural Members

No structural member shall be chiseled or cut without the written permission of the Engineer-in-Charge.

16.12 Grab Bar

Providing and fixing of 600mm wall mounted, Movable (horizontally and vertically) Stainless Steel 35mm diameter Handicap/ Disabled Grab Bar (U shape) including cutting & making good the walls.

16.13 Mirror

Providing and fixing beveled edge mirror of superior glass (of approved quality) desired thickness, fixed with stainless steel studs, complete with cutting, making holes, studs, all fittings, screws, washers and making good the walls.

16.14 Water supply pumps

16.14.1 Borewell Pumps

The pumps shall be vertical, submersible, multistage centrifugal, stainless steel (304) casing, stainless (304) impeller, stainless steel (316) shaft, ceramic bearings, tungsten carbide shaft protection bushes and mechanical seal driven suitable rated motor with suitable RPM, 415±10% Volts, 50 Cycles, AC3 –phase. Each pump shall be capable of operating within a performance pressure characteristic range sufficient below and above the required working pressure.

The Pumps shall conform to Indian standard IS: 8034. Pumps and motors shall be mounts on a commonMS structural base plate. The pump shall be water cooled coupled to induction motor of suitable H.P and R.P.M specified in schedule of quantities. Pumping set shall be

provides with a Gun Metal “Bourden” type pressure gauge with gunmetal isolation cock and connecting piping. The pump set shallbe provided with gun metal gate valve of appropriate sizes on delivery & non-return valve ofappropriate size and a pressure gauge with cock shall be provided on the delivery line.

16.14.2 Domestic Water Supply Pumps

Domestic water transfer pumps shall be multistage, vertical stainless steel pumps, having stainless steelcasing, stainless steel pump foot and diffushers, stainless impeller, stainless steel shaft, ceramic bearings, tungsten carbide shaft protection bushes and mechanical seal driven by suitable kW, RPM, 400/440 Volts, Cycles, AC 3 –phase TEFC vertical flange motor. Each pump shall be capableof operating with in a performance pressure characteristic range sufficient below and above the requiredworking pressure. Pumps shall be suitable for manual operation. Pumps and motors shall be mounts ona common MS structural base plate. Each pump shall be provides with a totally enclosed fan cooled induction motor of H.P and R.P.M specified in schedule of quantities Each pumping set shall be provides with a Gun Metal “Bourden” type pressure gauge with gunmetal isolation cock and connecting piping. Appropriate vibration eliminating pads shall be provides with each pump. The pump set shall be provided with gun metal gate valve of appropriate sizes on delivery. a non-return valve ofappropriate size and a pressure gauge with cock shall be provided on the delivery line. Suction and delivery lines of the pumps shall be provided with double flanged reinforced Neoprene flexible pipe connectors. Connectors shall be suitable for a working pressure of each pump as specified in Scheduleof Quantities

16.14.3 Sump pumps

Pump shall be integral with submersible motor on a common shaft. The pump set shall be installed in vertical position in sumps with level controller cum operated float switches.

Pump casings shall be aluminum and impellers of SS. All pumps shall have combination ball and rollerbearings and shaft seals should be mechanical. Motor shall be submersible and shall be rated for minimum HP specified or the BHP absorbed in the operating range of the pump.

16.15 System Description

The system shall be supplied as complete set including suction and discharge common manifolds, non-return valves, isolating valves, pressure transmitter on the discharge side and electrode at the suction tank. Domestic Water Supply Pumps shall be suitable for manual operation.

16.15.1 Submersible Pump

These shall be fully submersible with a fully submersible motor. The pumps shall be provided with anautomatic level controller and all interconnecting power and control cabling which shall cause the pumps to operate when the water level in the sump rises to a preset level and stop when the preset lowlevel is reached.

Pumps for drainage shall be single stage, single entry.

Pump shall be C.I. casing and C.I. two vane open type with a dynamically balanced impeller connectedto a common shaft of the motor. The vane for sewage pump will be open type, while for drainage pump,etc. it will be of semi open type. The MOC of the sump shall be in accordance to schedule of quantity.
Stuffing box shall be provided with mechanical seals.

Each pump shall be provided with a suitably rated induction motor suitable for 415 volts, 3 phase, 50 Hz A.C. power supply. Each pump shall be provided with in built liquid level controller for operating the pump between predetermined levels

The pumping set shall be for stationary application and shall be provided with pump connector unit. The delivery pipe shall be joined to the pump through a rubber diaphragm, and bend and guide pipe foreasy installation

Pump shall be provided with all accessories and devices necessary and required for the pump to makeit a complete working system.

Sump pump shall be complete with level controllers, power and control switch gear, Auto/off/Manualswitches, pumps priority selections and control and power cabling upto motor and controller/probes etc. (Including earthing). Level control shall be such that one pump starts on required level, 2nd pumpcuts in at high level and alarms is given at extra high level. All level controllers shall be provided withremote level indications.

16.15.2 Motor Design

The pump motor shall be a squirrel cage induction, housed in air filled water-tight enclosure. Oil filledmotors are not acceptable. The stator windings shall be class `H' insulation for submersible type.

The stator shall be heat shrunk fitted into the enclosure and shall not use bolts, pins or other fasteners that penetrate through the stator enclosure. The starter shall be equipped with a thermal switch embedded in series in the coils of the stator windings to protect the stator from wheel.

The motors shall be designed for continuous running duty type at 415 volts, 3 phase, 50 Hz power supply and capable of sustaining a minimum of 20 starts/stops per hour.

Between stator housing and pump, a tandem seal arrangement will be provided with an oil barrier. Bothseals run in oil, allowing dry running without seal damage. Both seals shall be of the rubber bellows ormetallic bellow type with positive drive between shaft and rotating seal face.

16.15.3 Electrical works

Electrical equipment shall be suitable for electrical voltage specified in the bill of quantities and as required by local authorities. Motors shall be for heavy duty TEFC compatible for the

duties of the pumps. Motors shall be rated as required. Each motor shall be provided with a weather proof terminal. Connections to all motors shall be made with waterproof flexible connections with suitable bushes and terminal lugs.

Starters for motors shall be fully automatic type with push buttons. Direct on line (DOL) for motor up-to 10 HP. Starters for motors above 10 H.P. shall be automatic star-delta starters. Motor control centrefor the entire plant shall be dust and vermin proof construction fabricated from corrosion resistant M.S.sheets and comprising of:

- One incoming MCCB.
- Copper bus bar in separate chamber of ample capacity.
- One isolation MCB/ MCCB for each motor.
- One starter of required type for each motor.
- One set of ON/OFF indicating lamps for each motor.
- One voltmeter with selector switch on incoming main.
- One ampere meter for each motor.
- One single phasing preventer for each motor.
- All interconnecting colour coded wiring within the control center.

Any other devices and accessories necessary and required for a complete working system and as required by local authorities. All power and control cabling from MCC panel to all motors and controlsshall be 1100 volts grade with numbers of the cores necessary and required conforming to relevant IS. Entire electrical installation shall be earthed in accordance with local electrical rules. Slotted tray running on wall shall be provided for taking cables from MCC to various motors.

17. FIRE FIGHTING WORKS

Without restricting to the generally of the foregoing, the sanitary installations shall include thefollowing: -

a. Fire Fighting Works
b. Hydrant System
c. Fire Extinguishers

17.1 Fire Pump

a) The fire pump shall be single stage suction centrifugal type with split casing type and direct driven by electric motor as specified in schedule of quantities. The pump rating and performance shall conform tothe equipment schedule and meet the TAC duty requirements.

b) Pump casing shall be of close-grained cast iron with bronze impeller. The shaft sleeve shall be brass or SS 304 and the trim shall be brass or bronze.

c) Pump shall be capable of delivering 150% of the rated capacity at 65% of the rated

head and the no- delivery head shall be not more than 140% (150% in case of end suction type) of the rated delivery head. The pump casing shall withstand 1.5 times the no-delivery pressure or 2 times of the duty pressure whichever is higher.

d) The pump shall be electrically driven with direct flexible coupling.

e) The electric driven motor shall be squirrel cage induction conforming to IS 325 and rated for continuous duty (S1). Motor shall have not less than class F insulation and minimum enclosure of IP22. The starter shall be air cooled fully automatic star delta or auto transformer type. Starters shall conform to IS 8544 and rated for AC-3 duty conditions.

f) Drive rating shall be based on the largest of the following:

i) Rated pump discharge at rated head

ii) 150% of rated discharge @ 65% of rated head

iii) Maximum power absorbed by the pump in its operating range i.e. no-delivery to free discharge.

17.2 Accessories

The Fire Pumps shall be complete with the following accessories:

a) Suction and discharge eccentric reducers

b) Pump coupling guard

c) Common base frame, fabricated mild steel or cast iron.

Each pump shall have independent set of pressure switches. The pressure switch shall be snap action SPDT switch rated 10A @ 220 V operated through a stainless-steel diaphragm. The switch shall have a pointerfor manual adjustment of set point, and all electrical connections shall be terminated in a screwed terminalconnector. The entire unit shall be encased in a cold drawn steel (heavy gauge) enclosure. The diaphragm shall be designed for a maximum operating pressure of the system. Each pressure switch shall be providedwith a pressure gauge in parallel as shown on the drawings and all gauges and pressure switches shall be mounted in an instrument panel with necessary control piping and drainage facility.

17.3 System operation and control panels

a. The fire pump shall be started automatically on loss of pressure and the operation sequence of the booster and fire pumps shall be as follows:

i. The Fire Pump shall start when the system pressure drops by 1.0 kg/cm2 and shall continue to run till manually switched off.

b. The motor starters (direct on line or star-delta) shall consist of electrically actuated contactors. The starter shall be complete with ON-OFF push buttons, timers and auxiliary contacts and shall be fully automatic. There shall be an indicating lamp with each of the pumps and an ammeter and selector switch with the fire pumps. Fire pump starting shall be annunciate through an electric siren.

c. The starter along with isolator shall be housed in a 14 SWG MS box duly rust inhibited through a process of degreasing and phosphating.

d. All cabling to and from the pumps to starter and control switch shall be carried out through armoured PVC cables of approved makes. Cables shall be laid in accordance with section "M V CABLING". The pump motors and panels shall be

double earthed in accordance with IS 3043 or as shown on drawings and as approved.

17.4 Fire hydrants and hose reels

a. Hydrants shall be provides internally as shown on the drawings. Internal hydrants shall be providing at each landing of and escape staircase and additionally depending on the floor area as shown on drawings.Landing valve shall be single headed gunmetal valve with 63 mm dia outlets and 80mm inlet conformingto IS 5290. Landing valve shall have flanged inlet and instantaneous type outlets and mounted at 1.0mabove the floor level. Instantaneous outlets for the hydrants shall be of standard pattern approved and suitable for 63mm dia fire brigade hoses. Wherever necessary, pressure reducing orifices plate and shallbe provided so as to limit the pressure to 3.5 kg/sqcm or any other rating as required by the Local Fire Authority.

b. Each landing valve shall have a hose reel cabinet as shown on drawings.
   i. Landing valve with single 63 mm dia outlet and 80 mm dia inlet.
   ii. First-aid hose reel with 30 m long 25 mm dia high pressure double braided rubber hose (IS:444 marked)with 25 m dia Ball Valve.
   iii. 2 Nos. 15.0-Meter-long 63 mm dia Reinforced Rubber Lined (RRL) hoses with gun metal I.S. markedinstantaneous couplings.
   iv. One-gun metal branch pipe.

c. The First Aid Hose shall conform to IS 884 and be wound on a heavy-duty circular hose reel with a bracket. The hose shall be permanently connected on one end to the Wet Riser through a 25m Ball Valve with necessary hose adapter and a gun metal nozzle at the other end.

d. Hoses shall be in two lengths of 15.0 m each, of RRL type with instantaneous couplings, neatly rolled into bundles and held in position with steel brackets. Hoses shall be tested and certified by the manufacturer, to withstand an internal water pressure of not less than 35 kg / sqcm without bursting. The hose shall also withstand a working pressure of 7 kg / sqcm without leakage.

e. The hose cabinet shall be fabricated from 2mm mild steel sheet duly rust inhibited through a process of degreasing and phosphating. The cabinet shall have double flap hinged doors with 4mm clear glass and shall have necessary openings for riser main and brackets for all internals. The cabinet shall receive two coats of red oxide primer both inside and outside before two after coats of final paint of approved colour shade.

f. The fire brigade connection shall consist of two / three/four headed 63mm dia gun metal outlets with built-in check valve and drain plugs connected to a 150mm dia outlet connection to the water reservoir or to the hydrant main. The fire brigade collecting head shall conform to IS 904.

17.5 Test & commissioning

The fire pump starting and stopping shall be tested by opening the test valve and record the following and the valves should be as furnished below:

i. System pressure at start-up : 2.0 kg/sqcm

ii. System pressure at stop : 3.5 kg/sqcm

iii. Time elapsed from start to stop : 2 Seconds

17.6 Mode of measurement

Fire pump with mounting frame, excluding concrete foundation shall be measured per unit. Instrument panel with pressure gauges, pressure switches, control piping etc. shall be measured as one unit. Controlcabling from pressure gauge panel to the respective starters shall be measured in running meter and paid at unit rates.

17.7 Piping for Fire Fighting System External

17.7.1 All External pipes shall be, unless otherwise specified, heavy quality mild steel tubes to IS 1239 usingwrought GI steel heavy duty screwed fittings. Flanges shall be provided to mate with valves and otherequipment and shall conform to IS 6392. Flanges shall be screwed type. Flanges shall be rated for 2.0N/sqmm.

17.7.2 Black mild steel pipes, when laid underground, shall be protected against corrosion by two coats of hotbitumen and 2mm thick wrapping of pypkote. Fittings shall be weld able wrought iron, suitable for buttwelding and 10% of the welded joints shall be radio graphically tested and found in order. The weldedjoints shall be random selected for testing in consultation with the Engineer-in-charge. All flanges shallbe slip-on welded type to IS 6392 with a 3mm fibre-reinforced Teflon gasket and rated for 2.0 N/sq. mm.

17.7.3 Underground mains shall be laid not less than 750 mm below the ground level and shall be at least 2maway from the building face and supported on concrete pedestals at every 3.5m and held on with galvanised iron clamps. Concrete thrust anchors shall be provided at all bends and tees as shown on drawing and as directed. All excavation for pipe laying shall be carried out with sufficient width for making proper joints. Backfilling shall be done only after the piping is hydro-statically pressure tested.Piping shall be constantly kept clean till tested.

17.7.4 All valves shall be housed in brick masonry chambers over 150mm cement concrete (1:3:6) foundation.The brick walls of the chamber shall be plastered inside and outside with 20mm cement sand plaster 1:4with a floating coat of neat cement. Chambers shall be 650 x 650 mm clear for depths upto 1200 mm and 1000 x 1000 mm for depths beyond or as required. Each chamber shall have a cast iron surface box approved by theEngineer in-charge.

17.7.5 Piping laid above ground shall be supported on cement concrete (1:2:4) pedestals raising the bottom ofthe pipe at least 150mm over the ground level and held to the pedestals with galvanised clamps. Pedestalsshall be made at 3.0m centre to centre and as shown on drawings. Cement concrete 1:2:4 thrust anchorsshall be provided at all tee-off points and change of direction as shown on drawings and as required. Pipeslaid on walls and ceiling shall have galvanised steel brackets.

17.8 Internal

17.8.1 All internal pipes shall be, unless otherwise specified, heavy quality mild steel tubes to IS 1239 using wrought steel heavy duty screwed fittings. Flanges shall be provided to mate with valves and other equipment and shall conform to IS 6392. Flanges shall be screwed type. Flanges shall be rated for 2.0 N/sqmm.

17.8.2 Valves shall be suitable for external piping.

17.8.3 All pipes shall be of approved make and best quality without rust marks. Pipes and fittings shall be fixed in a manner as to provide easy accessibility for repair, maintenance and shall not cause obstruction in shafts, passages etc. Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanship manner. Pipes shall be securely fixed to walls and ceilings by suitable supports at intervals specified. Only approved type of anchor fasteners shall be used for RCC ceiling and walls.

17.8.4 All pipes shall be adequately supported from ceiling or walls through structural supports fabricated from mild steel structural e.g., rods, channels, angels and flats generally as shown on drawings. Fasteners shall be shear type anchor fasteners in concrete walls and ceilings and wrought steel spikes of at least 75mm long in brick walls. All pipes support shall be painted with 1 coats of red oxide primer and two coats of black enamel paint.

17.8.5 All low point loops in the piping shall be provided with 25mm Ball Valves with rising spindle for draining the system. All valves shall have screwed brass caps. Likewise, 25mm gun metal air vents shall be provided at all high point loops to prevent air-locking.

17.8.6 All piping shall have flanged joints at about 25m intervals to facilitate easy maintenance.

17.9 Pipe Jointing

17.9.1 All pipes shall be provided with threaded joints up to 50mm diameter and welded joints for pipe above 50mm diameters. Hold tite shall be used for sealing.

17.9.2 All welded joints shall be tested by radiography test.

17.9.3 Joints between CI and GI pipes shall be made by providing a suitable flanged tail or socket piece and MS flange on the GI pipe. Flanges shall have appropriate number of holes and shall be fastened with nuts, bolts and 1.5mm thick compressed asbestos gasket.

a) Valves and other accessories

b) Gate Valves

i. Sluice / Gate valves shall be used for isolation of flow in pipe lines For sizes upto 65 mm, gate valves shall be outside screw rising spindle type and shall be as per IS: 778 Class-I and Class-II, as applicable.For sizes 80 mm to 300 mm, gate valve shall be as per IS: 780, PN=1.0 and shall be of inside screw andnon-rising type and cast iron double flanged.

ii. Gate valves shall be provided with a hand wheel, draining arrangement of seat valve and locking facility(as required). Gate valves shall have back setting bush to facilitate gland renewal during full open condition.

iii. The Body, bonnet, Stuffing Box, cap and hand wheel shall be of cast iron to

IS:210, grade FG 200 / 260.The non-rising spindle shall be of solid forged high tensile brass or carbon steel to AISI 304 construction.The Body seating and wedge ring shall be of solid leaded gun metal. The Bonnet gasket shall be of highquality rubber.

iv. The Valve shall be PN 1.0 rated but shall withstand tests of upto 20 kg / cm2. The ends shall be flanged.The batch number of the valve shall be punched on the top of the flange. The spindle shall be removabletype, and shall be easily rotated.

c) Pressure Switch

i. The Pressure switches shall be employed for starting and shutting down operation of pumps automatically,dictated by line pressure. The Pressure Switch shall be diaphragm type. It shall be suitable for line pressures upto 15 kg / cm2. The scale range for cut in and cut out shall be from 0 to 10 kg / cm2.

ii. The Switch shall be suitable for consistent and repeated operations without change in values. It shall beprovided with IP: 66 water and environment protection.

iii. The enclosure shall be of aluminium and pressure element and wetted parts shall be of stainless steel.The switch shall be snap acting type with 1 number N O / N C contact.

d) Pressure Vessel

i. The Pressure Vessel shall be provided to compensate for slight loss of pressure in the system and to provide an air cushion for counter acting pressure surges whenever the pumping set comes into operation.It shall be normally partly full of water; the remaining being filled with air which will be under compression when the system is in normal operation.

ii. Pressure vessel shall be fabricated from 8-10 mm thick MS plate with dished ends and suitable supportinglegs. It shall be provided with a 50 mm dia flanged connections from pump, one 25 mm drain with ballvalve, one water level gauge and 25 mm sockets for pressure switches. The pressure vessel shall be hydraulically tested as required.

iii. The Pressure Vessel shall be for Hydrant Systems. The Pressure Switches shall be mounted on the drainend of each Vessel. The Vessel shall also be provided with an air release valve mounted at the top.

e) Pressure Gauge

The Pressure Gauge shall be constructed of die cast aluminum and stove enameled. It shall be weatherproof with an IP 55 enclosure. It shall be a stainless steel Bourden tube type Pressure Gauge with a scalerange from 0 to 16 Kg / cm^2 and shall be constructed as per IS: 3624. Each Pressure Gauge shall have a siphon tube connection. The Shut off arrangement shall be by Ball Valve.

f) Ball Valve

The Ball Valve shall be made from die cast brass and tested to 14 Kg/cm^2 pressure.

i. The valve shall be internally threaded to receive pipe connections.

ii. The Ball shall be made from brass and machined to perfect round shape and subsequently chrome plated.The seat of the valve body- bonnet gasket and gland packing shall be of Teflon.

iii. The handle shall be of chrome plated steel with PVC jacket. The handle shall also indicate the directionof `open' and `closed' situations. The gap between the ball and the teflon packing shall be sealed to preventwater seeping upto 14 Kg/cm^2 pressure.

iv. The handle shall also be provided with a lug to keep the movement of the ball valve within 90 degree. Thelever shall be operated smoothly and without application of any unnecessary force.

g) Non Return Valve

i. Non-return valves shall be cast iron spring action swing check type. An arrow mark in the direction of flow shall be marked on the body of the valve. The valve shall bear IS: 531 certifications.

ii. The Valve shall be of cast iron body and cover. The internal flap in the direction of water shall be of cast iron and hinged by a hinge pin of high tensile brass or stainless steel. Cast iron parts shall be conform to IS: 210, grade 200 / 260 type.

iii. The gasket shall be of high-quality rubber and flap seat ring of leaded gun metal to BS 1400 LG 2C. At high pressure of water flow the flapper shall seat tightly to the seat. The Valve shall be capable of handling pressure upto 15 kg/cm2.

h) Butterfly Valve

i. The Butterfly Valve shall be suitable for waterworks and tested to minimum of 16 kg / sq cm pressure. The Valves shall fulfil the requirements of AWWA (American Water Works Association) C 504, API 609 and MSS-SP-67.

ii. The body shall be of cast iron to IS: 210 in circular shape and of high strength to take the minimum water pressure of 10 kg/cm2. The disc shall be heavy duty cast iron with anti-corrosive epoxy or nickel coating.

iii. The valve seat shall be of high-grade elastomer or nitrile rubber. The Valve in closed position shall have complete contact between the seat and the disc throughout the perimeter. The elastomer rubber shall have a long life and shall not give away on continuous applied water pressure. The shaft shall be of EN 8 grade carbon steel.

iv. The Valve shall be fitted between two flanges on either side of pipe flanges. The Valve edge rubber shall be projected outside such that they are wedged within the pipe flanges to prevent leakage.

v. The Valves shall be supplied with manual gear operated opening / closing

system by lever.

i) Pipe supports

All pipes whether horizontal or vertical shall be suitably supported using galvanized mild steel clamps/clevis hanger manufactured of good quality as approved by engineer in-charge.

j) Vertical Pipes

The pipes running vertical shaft shall be supported by galvanised mild steel rigid clamps fixed to wallwith anchor bolts and studs.

When the horizontal distance between the centre line of two adjacent pipes is less than 300 mm a powdercoated rail shall be fixed to wall the pipes independently clamped to the rail with `U' bolt clamps.

k) Horizontal Pipes

Pipes running horizontal shall be supported from structural beam/slab by using appropriate galvanised m.s. pipe clevis hangers. Other specification as per CPWD.

The spacing of supports shall be as follows:

GI Pipes/MS Pipes		CI Spun Pipes	
Internal Dia (mm)	Spacing (mm)	Internal dia (mm)	Spacing (mm)
15	1800	75-150	2700
20,25	2400	200-250	3000
32	2700	300	3600
40-50	3000		
65-80	3600		
100	4000		
150	4500		

Supports for horizontal piping longer than 15m in a stretch shall be provided with swivel clamps. Otherwise, the clamps shall be universal clamps or rigid clamps as required by the project engineer.

l) Fixing of clamps/rails etc.

All clamps, rails and accessories shall be fixed to the structure (beam, slab, walls etc.) by using approvedgood quality anchor fasteners of appropriate size.

m) Painting

All exposed piping for firefighting shall be distinctly painted `Fire red' shade 536 to IS:5-2007. Pipes shallfirst receive two coats of red oxide primer uniformly applied and two coats of oil paint applied thereafter.All pipes support shall be painted black as specified for support & clamps.

17.10 Painting Schedule

All equipment and piping shall be painted in accordance with the following colour code:

Equipment	Colour	Distinguishing Mark
a) Pump motors	Fire Red Shade No.536 to IS: 5 -2007	
b) Internal piping	"	
c) Landing valves & Hose reel cabinets	"	
d) External Hydrants	"	
e) Fire brigade connection	"	
f) Priming tank	"	
g) Air vessel	"	
h) Electric panels	Black & Red	
i) Fire Alarm Panel	Black & Red	
j) Repeater panel	Black & Red	
k) Break Glass Unit	Fire Red	
l) Hooters/Speakers	Fire Red	
m) Sprinkler pipes	Fire Red	

All surfaces to be painted shall be thoroughly cleaned with wire brush to remove completely rust and other extraneous substances. Over the cleaned surfaces one coat of red oxide primer shall be applied completely covering the exposed surfaces. Finishing coat of enamel paint shall be applied one day afterthe prime coat, after ensuring that the paint is dry. The

second coat shall be done before the installationis handed over and after approval to do so from the Engineer-in-charge.

17.11 Testing & commissioning

All piping after installation shall be tested for a hydrostatic test pressure of 10.5 kg/sqcm or 1.5 times theworking pressure (whichever is less) maintained for 24 hours. All joints and valves shall be checked forleaks and rectified and retested. During testing all valves except drain & air valves shall be kept fully open.

17.12 Mode of measurement

- All external piping shall be measured along the centre line of the pipe and paid per unit length and shall include:
- All pipes & fittings
- Bituminous coating
- All internal piping shall be measured similarly but shall include for the pipe supports and clamps.
- All valves, air valves, drain valves together with flanges or tail pieces shall be measured per unit.
- All excavation and concrete supports and thrust blocks shall be measured as per drawing and paid for percum
- The cost of pipe supports described above form part of the rate quoted for piping and no extra shall bepayable on the account.

18. PORTABLE FIRE EXTINGUISHERS & EXIT SIGNAGES

The scope of work covers the supply and installation of portable fire extinguishers. The following typesare envisaged in these specifications and provided as shown in the schedule of portable fire extinguishers.

- ABC Dry powder extinguisher
- Carbon-dioxide extinguisher

18.1 Standards

The following standards and rules and regulations shall be applicable:

IS:2176 : Portable fire extinguisher Dry power type
IS:2878 : Portable fire extinguisher carbon-dioxide type

18.2 Extinguishers

Carbon dioxide type

a. The extinguishers shall be rated for 4.5 and 9 kg by weight or carbon dioxide, unless stated otherwise.The contents shall be with a filling ratio not exceeding 0.667.
b. The body shall be steel cylinder made according to IS:2872 and approved by the chief controller of explosives.
c. The discharge head shall be simple and safe to operate conforming to IS:3224 with a safety release to IS:5903 set to 18.0 to 20.0 N/sqmm. A syphon tube of copper

or PVC shall be fitted. A non-conducting discharge horn and a high pressure hose (27.5 N/sqmm pressure) shall be fitted with each extinguisher.

d. The discharge system shall be designed to expel 95% of the contents in continuous discharge as follows:

Capacity (kg)	Time (Sec.)
4.5	10 - 24
9.0	15 - 36

ABC Dry Powder type

a. The capacities envisaged are 2 kg & 6 kg. The filling pressure shall be 0.95 +/- 0.055 N/sqmm.

b. The body shall be cylindrical in shape and made of cold rolled carbon steel grade D/DD or hot rolled steel plate with radiographically tested welded construction. Plate thickness shall conform to IS:11108.

c. Discharge valve mechanism shall be a simple and safe squeeze grip valve. 4.5 kg and above capacity shall have a high pressure (0.5 N/sqmm) hose and non-conducting horn and shall also be provided with a pressure gauge. 95% of the contents shall be discharged as follows:

Capacity (kg)	Time (sec)	Throw (m)
2.00	8 - 16	2
6.00	15 - 24	4

d. The internal and external components and surface shall be treated for anti-corrosion as for dry powder type extinguishers.

18.3 General requirements

a. All extinguishers shall be standard products approved by the Tariff Advisory Committee and Local Fire Authority and manufactured and tested strictly in accordance with the relevant Indian Standard. All markings and test results shall be stamped in the appropriate colour markings accordingly to the IndianStandards.

b. All extinguishers shall have a structurally designed galvanised steel handle and also a suitable wall mounting bracket.

List of Standard Codes

S.No.	IS Code No.	Description
1.	IS:780:1984	Specification for sluice valve for water works purposes (6th rev.) (50 to 300 mm size) (amendment 3)
2.	IS:13095:1991	Butterfly valves for general purposes

S.No.	IS Code No.	Description
3.	IS:5312 (part 1) : 2004	Swing check type reflux valves (non-return valve): part 1 single door pattern
4.	IS:884:1985	Fire aid hose reel for fire fighting
5.	IS:901:1988	Coupling double male and female instantaneous pattern for fire fighting
6.	IS:903:1993	Fire hose delivery coupling, branch pipe, nozzles and nozzles spanner
7.	NBC-2016 Part IV	National building code of India 2016
8.		Central public works division (CPWD) Part-V, wet riser system for firefighting 2020, Govt. of India
9.	IS:3844-1989	Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises
10.	IS:2190:2010	Code of practice for selection and maintenance of first-aid fire extinguisher
11	IS:6382:1984	Code of practice for design and installation of fixed system carbon dioxide fire extinguishing system
12.	SP:35 (s&t)-1987	Hand book on water supply & drainage by bureau of Indian standards
14.	IS:933-1989	Specifications for portable chemical from fire extinguisher
15.	IS:2171-1999	Specifications for portable fire extinguishers, dry power

19. ELECTRICAL WORKS

19.1 Switchgears & SwitchboardsStandards and codes

	Specification for low voltage switchgear andcontrol gear	
	• General Rules	IS 13947 Part-1 : 1993
	• Circuit breaker	IS 13947 Part-2 : 1993 IEC-62271
	• Switches, disconnectors, switch disconnectors and fuse combination units	IS 13947 Part-3 : 1993
	• Low voltage switchgear and control gear Specification - Control circuit devices and switching elements	IS 8623
	➢ Electro mechanical control circuit devices	IS 13947 Part-5 : Sec-1 : 2004

	➢ Proximity switches	IS 13947 Part-5 : Sec-2 : 2004
	Guide for uniform system of marking and identification of conductors and apparatus terminals	IS 113553 : 1985
	Electrical relays for power system protection	
	General introduction and list of parts	IS 3231 Part-0 : 1986
	• General requirement	
	➢ Contact performance	IS 3231 Part-1 : Sec-1 : 1986
	➢ Insulation tests	IS 3231 Part-1 : Sec-2 : 1986
	➢ High frequency disturbance test for static relay	IS 3231 Part-1 : Sec-3 : 1986
	• **Requirements for principal families**	
	➢ All or nothing relays	IS 3231 Part-2 : Sec-1 : 1987
	➢ General requirement for measuring relay	IS 3231 Part-2 : Sec-2 : 1987
	➢ General requirements for thermal relay	IS 3231 Part-2 : Sec-3 : 1987
	• Requirements for particular group or relays : Biased (percentage) differential relay	IS 3231 Part-3 : Sec-3 : 1987
	• Requirements for particular group or relays : Directional relays and power relays	IS 3231 Part-4 : Sec-3 : 1987
	Specification for low voltage switchgear andcontrol gear assemblies :	
	• Requirements for type tested and partially type tested assemblies	IS 8623 : Part 1 : 1993
	• Particular requirements for bus bar trucking system (bus way)	IS 8623 : Part 2 : 1993
	• Particular requirements for equipment where unskilled person have access fortheir use	IS 8623 : Part 3 : 1993
	Code of practice for selection, installation, and maintenance of switchgear and control gear	
	• General	IS 10118 Part-1 : 1982
	• Selection	IS 10118 Part-2 : 1982

	• Installation	IS 10118 Part-3 : 1982
	General requirement for switchgear and control gear for voltage not exceeding 1000 volt AC or 1200 volt DC	IS 4237 : 1982

19.1.1 Switchgear

A. Molded Case Circuit Breakers (MCCB)

- Type Molded case circuit breaker
- Operating voltage 415/690-volt 3 phase 50 Hz
- Insulation Voltage - 690 volts
- Current rating - as per Schedule of Quantities
- Fault Level withstand Ices - As per Schedule of Quantities
- Icu - 100% Ics
- Icw - 100% Ics
- Isolation function - as per IEC 60947-2 Section 7.12
- Insulation - class II insulation between the front panel and internal power circuits
- Cubicle mounting - Fixed unless otherwise specified
- Operating mechanism - Trip free
- Independent Manual spring closing (IMS) or motor wound spring closing mechanism (MWS) as perSchedule of Quantities
- No of Poles - 3 or 4 as required
- All current carrying parts - Silver plated
- Arcing contacts shall be provided to protect the main contacts and shall be separate from the maincontacts and easily replaceable.
- Arc chutes shall be provided for each pole, and shall be suitable for being lifted out for the inspectionof the main and the arcing contacts.
- Common Operating handle required for three phase MCCBs for simultaneous operation and trippingof all the three phases.
- Indications and Operations integral with ACB on front
  a) Mechanical ON/OFF/ Tripped indication
  b) Operating handle
  c) Mechanical trip push button
- Accessories - Following accessories shall be provided as required
  i. Under voltage trip
  ii. Shunt trip
  iii. Alarm switch
  iv. Auxiliary switch

- Circuit Breaker Interlocking - Interlocks shall be provided to ensure the following:
  i. Handle interlock to prevent unnecessary manipulations of the breaker.
  ii. Door interlock to prevent door being opened when the breaker is in ON position.
  iii. DE interlocking device to open the door even if the breaker is in ON position.

  Sheet steel hinged lockable doors for each separate compartment shall be provided and duly interlockedwith the breaker in "ON" and "OFF" position.
- Protection Microprocessor based releases and/or thermal magnetic releases shall be provided for the Circuit Breakers as stipulated in the Schedule of Quantities
- Electrical endurance Upton 250 amps minimum 10,000 operations
- For 400 amps & above minimum 4,000 operations
- Type test certificates Submit Certificates from a recognized test house for the Circuit Breakers offered.

19.1.2 Switchboard

- Supply System Three phase 4 wire, 415-volt, 50 Hz, Indian TN-S system.
- Short circuit level withstands as per Schedule of Quantities.
-
- Ingress protection IP 42 as applicable.
- Metal based neoprene gaskets between all adjacent units and beneath all doors and covers shall be provided to render the joints dust and vermin proof.
- Pressure relief devices shall be provided to minimize danger to operator during internal fault conditions.

Panel Compartmentation

- Compartment Tier 3A as per IEC 6043 (Part-I) unless otherwise stated in Schedule of Quantities.
- Circuit Breaker Metering Separate segregated compartment shall be provided for accommodating instruments, indicating lamps, control contactors and control MCB etc. These shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker, bus bars and connections.
- Control wiring compartment a horizontal wire way with screwed cover shall be provided at the top to take interconnecting control wiring between vertical sections.
- Panel Configuration
- Panel configuration - MCCB's arranged multi-tier formation.
- Air Circuit Breakers - Single or double tier formation.

- Spare Space provision - The Switchboards shall have a provision of 25% spare space to accommodate possible future additional switch gear.
- Extensible shall be extensible on both sides.

Panel Construction

- Metal clad totally enclosed,
- Dead front
- Floor mounted
- Free standing type
- Modular extensible design
- Suitable for indoor mounting.

Switchboard cubicles, doors and covers - Fabrication with CRCA Sheet Steel

Cubicles - Thickness shall be 3.0 mm for load bearing compartments and 2.0 mm for non-load bearingcompartments, folded and braced to ensure rigid support for all components.

Doors/ covers - Thickness not less than 1.6 mm & should be properly earthed.Joints - Seam welded
Welding slag - Ground off
Welding pits - Wiped smooth with plumber metal.

Switchboard frames Fabrication

With electro galvanized MS sheets ‘U’ Channel switchboard frames of 2.5 mm thick

All joints should be neatly formed and finished flush with adjacent surfaces, No joints shall be located incorners. Bare edges shall be round/covered

Structural members and bracings where ever required shall be welded or bolted to the frame. The frameshall be of modular design and extensible.

Cable compartment Rear Access switchboards

All cabling from rear, Front access switchboard, Separate vertical cable accessible from front only. Adequate space shall be provided for ease of installation and maintenance with safety for working withoutcoming into contact with any live parts.
The cable chambers shall be complete with

- Adequate support for cables.
- Tinned brass cable sockets,
- Tinned brass compression glands,
- 3 mm thick gland plates,
- Supporting clamps and brackets etc. for termination of 1,100-volt grade aluminum conductor XLPE cables.
- Door handles Good quality door handles fitted with toggles to operate rods to latch with suitable slots in both top and bottom of switchboards shall be provided. Latching rods and associated brackets shall be cadmium plated.

- Operating handles all operating device shall be located in front of switchgear only.
- Fixing Screws Fixing screws shall enter holes tapped into an adequate thickness of metal or provided with hank nuts. Self-threading screws shall not be used in switchboards.
- Dimensional Limitations
  i. Base channel 75 mm x 5 mm thick shall be provided at the bottom.
  ii. Minimum 200 mm blank space between the floor of switchboard and bottom most unit shall be provided.
  iii. Overall height shall be limited to 2,300 mm unless otherwise stipulated.
  iv. Height of the operating handle, push buttons etc. shall be restricted between 300 mm and 1,700 mm from finished floor level.

Switchboard Bus Bars, Interconnections etc. rating

- Rating of Bus Bars, interconnections and to feeders these shall be designed as per requirements in Schedule of Quantities to-Carry full load current for phase and neutral bus bars Withstand the stresses of fault level. For aluminum & copper current density shall be of minimum cross section of 0.6 & 1.0 amp per sq. mm respectively.

Switchboard Bus Bars

- Bus Bar material High conductivity, high strength aluminum alloy, complying with requirements of grade E 91E of IS 5082 – 1981

  Alternatively, Electrical grade 99.99% pure copper as per Schedule of Quantities

- Bus Bar Insulation Heat shrunk PVC sleeking of 1.1 kV grade and bus bar joints provided with clip-on shrouds.
- Bus Bar supports Non-breakable, non-hygroscopic epoxy resin or glass fiber reinforced polymer insulated supports able to withstand operating temperature of - 25°C to 130°C (degree of protection IP 65 IEC 60529) at regular intervals, to withstand the forces arising from a fault level as stipulated in schedule of quantities.
- Colour coding all bus bars shall be colour coded.
- Auxiliary Bus Electrolytic Copper Auxiliary buses for control power supply, space heater power supply or any other specified service shall be provided. These shall be insulated, adequately supported and sized to suit specific requirement.

Switchboard Interconnections

- Interconnection material Unit ratings up to 100 amps,
- FRLS PVC insulated copper conductor wires with crimped terminations.
- Rating of 100 amps and above solid copper/aluminum connections PVC sleeved
- Interconnection jointing all connections, tapings etc.
- Shall be made to ensure minimum contact resistance.
- Shall be firmly bolted and clamped with even tension before assembly.
- Joint surfaces shall be filed or finished to remove burrs, dents and oxides and Silvered to maintain good continuity at all joints.
- All screws, bolts, washers shall be cadmium plated.

- Approved spring washers shall be used with cadmium plated high tensile steel bolts with BSF threads.
- Instrument and control wiring all wiring for relays and meters shall be with ZHFR PVC insulated copper conductor wires. The wiring shall be coded and labelled with approved ferrules for identification. All power circuit wiring shall be minimum 2.5 sqmm and control circuit wiring shall be of minimum 1.5 sqmm and for CT & PT minimum 4sqmm copper cable shall be considered.

Earthing

Continuous earth bus sized for prospective fault current shall be provided with arrangement for connecting to station earth at two points. Hinged doors / frames shall be connected to earth through adequately sized flexible braids.

Space Heaters

Anti- condensation heaters shall be fitted in each cubicle together with an ON/OFF isolating switch suitable for electrical operation at 230 volts A.C 50 Hz single phase of sufficient capacity to raise the internal ambient temperature by 5°C operation interlocked with switchgear.

- Sheet Steel Treatment and Painting Sheet steel used in the fabrication of switchboards shall undergo arigorous cleaning and surface treatment seven tank process comprising of alkaline degreasing, descaling in dilute Sulphur acid and a recognized phosphating process after which a coat of primer paint comp actively with the final paint shall be applied over the treated surface. Final paint coat of oven baked powder coating, of minimum 50-micron thickness, of sheet approved by Engineer-in- Charge shall then be provided.
- Labels Suitable engraved white on black metal identification labels shall be provided for each switchgear cubicle in front and back identifying the circuit, switchgear type, rating and duty.

Testing at manufacturers works

Following testing must be completed before dispatch of equipment at site, if required Engineer-In-Charge may call for factory inspection to ensure all testing are completed.

- All wiring checks and connections
- Relay adjustment
- Interlock function check
- Continuity checks of wiring, fuses
- Insulation resistance test
- Trip test
- High voltage test

- Testing and commissioning
- Assembly of various sections of panels
- Grounding the units
- Bus bar termination on switchgear
- Insulation test with 500 volts megger. The insulation resistance should be more than 100 mega ohms
- Local Authority Requirements. All requirements by the local Authority including those listed below shall be complied with
- Provision for Gas nozzles within each cubicle
- Danger Notice Plate
- Rubber floor mat of minimum 6 mm thickness and 1 m width provided for the full length of the switchboard.
- A dry chemical type fire extinguisher of required capacity with approved label.

19.2 Relays, CTs, PTs, Meters, Indicating Lamps etc.

This section covers specifications for Protection and Control Relays for breakers, Instrument Transformers, Measuring Instruments, Push Buttons, and Indicating Lamps etc. required in LT andHT switchboards.

Standards and codes

Updated and current Indian Standard Specifications and Codes of Practice will apply to the equipmentand the work covered by the scope of this contract. In addition, the relevant clauses of the Indian Electricity Act 2003, Indian Electricity Rules 1956, National Building Code 2016, National ElectricalCode (SP30 : 2011), Code of Practice for Fire Safety of Building (general): General Principal and Fire Grading – IS 1641 as amended up to date shall also apply. Wherever appropriate Indian Standards arenot available, relevant British and/or IEC Standards shall be applicable.

Application guide for Current Transformers	IS 2705
Application guide for Voltage Transformers	IS 3156
Instrument Transformers (Current & Voltage Transformers)	IEC 61869
Application guide for Relays	IS 3842
Electromagnetic Relays	IS 5051
Microprocessor Relays	IEC 60255

19.2.1 Protection and control relays

The Circuit Breaker shall have protection and control relays as specified in the bill of quantities. Relaysshall be approved types complying to relevant ISS and having approved characteristic. Relays shall beflush mounted in dust proof cases. Relays shall be arranged so that adjustments, testing and replacementcan be affected with minimum of time and labour.

In case of C.T. operated thermal overload and magnetic instantaneous short circuit release. The overload releases shall be such that each phase can be individually set depending on the phase unbalanced currents. The releases shall have inverse time current characteristics and the magnetic release shall be time delayed with a minimum setting of 25 ms varying up to 300 ms for discrimination without effecting the breaking current capacity of the ACB.

19.2.2 Current transformer

Separate sets of CTs shall be provided for metering and protection. C/Ts shall confirm to IS 2705 (part -I, II and III) in all respects. All C/Ts used for medium voltage application shall be rated for 1.1 kV. C/Ts shall have rated primary current, rated burden and class of accuracy as specified in Bill of Quantities/drawings. Rated secondary current shall be 5A unless otherwise stated. Minimum acceptableclass for measurement shall be class 0.5 and for protection class 5P10. C/Ts shall be capable of withstanding magnetic and thermal stresses due to short circuit faults on the bus. Terminals of C/Ts shall be paired permanently for easy identification of poles. C/Ts shall be provided with earthing terminals for earthing chassis, frame work and fixed part of metal casing (if any). Each C/T shall be provided with rating plate indicating:

i. Name and make

ii. Serial number

iii. Transformation ratio

iv. Rated burden

v. Rated voltage

vi. Accuracy class

CTs shall be mounded such that they are easily accessible for inspection, maintenance and replacement.Wiring for CT shall be with copper conductor FRLS PVC insulated wires with proper termination works and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

19.2.3 Potential transformer

PTs shall confirm to IS 3156 (Part-I, II and III) in all respects.

19.2.4 Measuring instruments

Direct reading electrical instruments shall conform to IS 1248 or in all respects. Accuracy of direct reading shall be 1.0 of voltmeter and 0.5 for ammeters. Meters shall be suitable for

continuous operationbetween -5 degree C and +50 degree C above ambient temperature. Meters shall be flush mounting andshall be enclosed in dust tight housing. The housing shall be of steel or phenolic mold. Design and manufacture of meters shall ensure prevention of fogging of instrument glass. Pointer shall be black incolour and shall have Zero position adjustment device operable from outside. Direction of deflection shall be from left to right. Suitable selector switches shall be provided for ammeters and volt meters used in three phase system. The rating type and quantity of meters, instruments and protective device shall be as per drawings.

Ammeters

Ammeters shall be of moving iron type. Moving part assembly shall be with jewel bearings. Jewel bearings shall be mounted on a spring to prevent damage to pivot due to vibrations and shocks. Ammeters shall be manufacture and calibrated as per IS 1248.

Ammeters shall normally be suitable for 5 A secondary of current transformers. Ammeters shall becapable of carrying substantial over loads during fault conditions.

Voltmeters

Voltmeters shall be moving iron type range of 3 phase 415-volt voltmeters shall be 0-500. Volt meters shall be provided with protection fuse.

Watt meter

Wattmeter shall be of 3 phase electro dynamic type and shall be provided with a maximum demand indicator if required.

Power factor meter

3 phase power factor meters shall be of electro dynamic type with current and potential coils suitable for operation with current and potential transformers provided in the panel. Scale shall be calibrated for 50% lag - 100% - 50% readings. Phase angle accuracy shall be +40.

Energy and reactive power meters

Trajectory meters shall be two elements, integrating type, kWh, kVA, kVArh meters. Meters shall confirm to IEC 170 in all respects. Energy meters, kVA, and kVArh meters shall be provided with integrating registers. The registers shall be able to record energy conception of 500 hours corresponding to maximum current at rated voltage and unity power factor. Meters shall be suitable for operation with current and potential transformers available in the panel.

19.2.5 Indicating lamps

Neon type indicating lamps shall be provided for indication of phases and Breaker position as requiredin the bill of quantities. Lamps shall be easily removed and replaced from the front of the panel by manual means not requiring the use of extractors.

19.2.6 Push buttons

Push buttons shall be of non-hygroscopic material, non-swelling and fitted to avoid any possibility of sticking. Contacts shall be of adequate strength and have a positive whipping action when in operation.

19.3 Battery and Battery Charger General

This section covers specifications for lead acid batteries and float cum boost battery chargers. DC is considered as unearthed system.

Standards and codes

Updated and current Indian Standard Specifications and Codes of Practice will apply to the equipmentand the work covered by the scope of this contract. In addition, the relevant clauses of the Indian Electricity Act 2003, Indian Electricity Rules 1956, National Building Code 2016, National ElectricalCode (SP30 : 2011), Code of Practice for Fire Safety of Building (general): General Principal and FireGrading – IS 1641 as amended up to date shall also apply. Wherever appropriate Indian Standards arenot available, relevant British and/or IEC Standards shall be applicable.

Electrical vocabulary secondary cells and batteries	IS 1885
Lead Acid SMF VRLA Batteries	JIS C8702
Stationary valve regulated lead acid	IS 15549:2005
Water for storage batteries	IS 1069
Sulfuric Acid for storage batteries	IS 266
General requirements for tests for lead acid storage batteries	IS 8320
Rubber and Plastic containers for batteries	IS 1146
Synthetic Separators	IS 6071
High performance planet cells	BS 6290 (Part II)
IE recommendations for sizing of large lead acid storage batteries	IEEE 485
Design and installation of storage batteries	IEEE 484
Stationary lead acid batteries (Part I)	IEC – 896

Battery

The battery shall be sealed maintenance free / valve regulated led acid (SMF/VRLA) battery. The batteries shall be manufactured using “absorbent glass matt” technology in which the electrolyte is in absorb condition, held within the pores of the glass matt separator. The separator is packed tightly between the positive and negative plates. “Led Calcium Tin Alloy” shall be used in the plate grid structure to eliminate harmful effect of early gassing. The container and the lid of the battery shall be of high-grade polypropylene. The vent plugs shall be provided

with self-resealing relief valves. The battery shall be rated for minimum 100 AH at 24-volt DC unearthed system. The battery sizing calculation to be carried out by vendor during detailed engineering stage and to be submitted to Electrical consultant for verification and approval.

Battery Charger General

The battery charger shall be float cum boost type, thermistors controlled. The charger shall haveselector switch for auto float – boost/manual, float /manual boost mode of operation. During auto float– boost mode, automatic changeover shall take place from float mode to boost mode and vice versa. This means that when the batteries are fully charged the charging shall automatically change from boostcharge to trickle charge.

Construction feature

The float cum boost charger and DC distribution board shall be housed in sheet steel cubicle of angle iron frame work with panels of 2.0 mm thickness, louvers for ventilation, glands plate will be providedfor cable entry from front bottom. The cubicle shall be painted in siemens grey shade. Four wheels/2 nose channels shall be provided at the base.

Performance

The DC output voltage of float /boost charger shall be stabilized within ± 2% for AC. Input variation of 230 V ± 10%, frequency variation of 50 Hz ±5% and DC load variation of 0-100%. The voltage regulation shall be achieved by a constant voltage regulator having fast response IGBT. The ripple content in output will be within 3% of DC output nominal voltage.

There shall be provision to select auto float/manual float /manual boost modes. During auto float modethe battery charging shall automatically changeover from boost mode to flat mode and vice versa. During manual float/boost modes it shall be possible to set the output volts by separate potentiometers.The battery charger shall have automatic output current limiting feature.

Components

The battery charger shall essentially comprise of the following

- 1 no. double pole ON/OFF MCB at AC input
- 1 no. pilot lamp to indicate charger ON.
- 1 no. main transformer: Double wound, naturally air cooled, having copper windings.
- 1 no. rotary switch to select auto float / manual float / manual boost. During auto float mode automatic changeover shall take place from float mode to boost mode and vice versa.
- 1 set solid state constant potential controller to stabilize the DC output voltage of the float cum boost charger at ±2% of the set value for AC input voltage variation of 230 V ± 10%, frequency variation of

- ±5% from 50 Hz and simultaneous load variation of 0-100% and also complete with current limiting circuit to drop the float charger output voltage upon overloads to enable the battery to take over.
- 1 no. electronic controller to automatically changeover battery charging from boost
- to float and vice versa 1 no. DC ammeter and toggle switch to read charger output current and battery charge/discharge current.
- 1 no. moving coil DC voltmeter to read the DC output voltage.
- 2 set potentiometers to adjust the output voltage during manual/auto float and boost modes.
- 1 no. double pole ON/OFF MCB at charger output. DC distribution board.
- Alarm annunciation

Visual and audible alarm with manual accept/ reset facility shall be provided for the following:

i. AC mains fail
ii. Charger fails
iii. Load / output over volt
iv. Potential free contact for BMS connectivity for maintaining battery status.

19.4 Technical Specification of 11KV 200Amp. (3-Pole/2-Pole) Air Break Switch

This specification covers manufacturing, testing and supply of 11KV 200Amp. 50Hz Air Break switches for outdoor installation in horizontal configuration. The switches are suitable for operation under off-load conditions only and are intended for use on Distribution Sub-stations and tapping sectionalizing points of 11 KV lines.

19.4.1 Description of the materials

The 11KV A.B. Switch sets shall confirm to the following parameters: -

a)	Number of poles	3
b)	Number of Post insulator per pole	2nos. 12KVpostinsulator.
c)	Nominal system voltage	11KV
d)	Highest system voltage	12KV
e)	Rated frequency	50Hz
f)	System earthling	effectively earthed.
g)	Rated nominal current	200 amps
h)	Altitude of installation	Not exceeding 1000M

The post insulators used in the A.B. Switches shall have the following ratings:-

a)	Power frequency withstand voltage (dry)	25KV (RMS)
b)	Power frequency withstand voltage (wet)	35KV (RMS).
c)	Implies withstand voltage(dry)	75KV
d)	Power frequency puncture withstand	1.3

19.4.2 Standards

The AB Switch Set shall conform to the following standards: -

a) IS-9920 (Part-I to V)
b) IS-2544/1973 (for porcelain post insulators)
c) IS-2633, (for galvanization of ferrous parts.) or its latest amendments if any.

19.4.3 Insulator make

12KV post insulators complete with post and cap duly cemented to be used in the AB Switch Setconforming to IS-2544/1973.

The bidder shall furnish the type test certificate of the post insulators from their manufacturer forreference and scrutiny.

The bidder shall mention make, type of insulation materials, metal fittings, Creepage distance, protected Creepage distance, tensile Strength, compressing strength, torsion strength and cantilever strength.

19.4.4 Climatic condition

The A.B. Switch set shall be suitable for operation under the following climatic conditions.

Maximum ambient air temperature	45 °C
Maximum daily average air temperature	35 °C
Maximum yearly average ambient air temperature	30 °C
Maximum temperature attainably by a body exposed to the Sum	50 °C
Minimum ambient air temperature	0 °C
Maximum relative humidity	100%
Minimum number of rainy days per annum	70
Average number of rainy days per annum	120
Average annual rainfall	150 cm
Number of months of tropical monsoon conditions	4
Degree of exposure to atmospheric pollution	Normally
Atmosphere.	Polluted

19.4.5 Other technical details

- **General: -** The 11KV A.B. Switch Set shall be the gang operated rotating single air breaktype having 2 post insulators per phase. The operating mechanism shall be suitable for manual operation from the ground level and shall be so designed that all the three phasesshall open or close simultaneously. The Switches shall be robust in construction, easy in operation and shall be protected against over travel or staining that might adversely affectany of its parts. The required base M.S. Channel (hot dip galvanized) phase coupling rod,operation rod with intermediate guide braided with flexible electrolytic copper, tail piece of required current carrying capacity and operation mechanism with “ON” & “OFF” positions shall be provided. The operation rod shall be medium gage of 32mm diameter nominal bore G.I. pipe single length 6 meters. The phase coupling rod for gang operationshall be of medium gauge 25 mm dia. nominal bore G.I pipe. The Rating post insulators shall be provide with suitable bearing mounted on a base channel with 8mm dia thrust collar and 6mm split pin made out of stainless steel. The operating down rod shall be coupled to the spindle (minimum) dia – 32mm for gang operation through another suitablebearing by two numbers 10mm dia stainless steel bolts with double nuts. All the bearingsshall be provided with grease nipple. All metal (ferrous) parts shall be galvanized a polished. The pipe shall be galvanized in accordance with IS-4736/1968.The post insulators should be fixed with the base channel using Galvanized Nuts and Bolts.

- **Mounting: -** The A.B. Switches shall be suitable for horizontal mounting in double pole sub-station structures. MS Galvanized base Channel & base support channel shouldbe of min. size 75x40x6 mm.

- **Switching Blades: -** It shall be made out of electrolytic copper with silver plated. The approximate size shall be 220mm X 50X 6 mm. The Switch shall have such a spring mechanism so as to ensure that the speed of the opening of contact is independent of speedof manual operation.

- **Fixed Contracts: -** The fixed Jaw type female contracts shall be made of electrolytic copper (minimum 95% copper composition) duly silver coated controlled by stainless steel high pressure spring housed in robust G.I. Cover. It is essential that provision shall be made in fixed female contracts to take the shock arising from the closing of move contract blade without the same being transmitted to the post insulator. The arrangement made in this regard shall be specifically shown in the drawing.

- **Arcing Horn:** - As the switches are generally meant for isolating transmission line and distribution transformers, suitable arcing horns shall be provided for breaking the chargingcurrent horn shall be made of 10mm dia. G.I. Rod with spring assisted operation.

- **Terminal Connectors: -** Terminal connectors shall be robust in design. The size of fixedconnector shall be (80 X 50 X 6 mm) and size of movable connector shall be of

(80 X 50)X (80 X 50) X 6 mm of copper casting with uniform machine finishing duly silver platedmade out of minimum 95% copper composition with 2 nos. 12mm dia holes provided withsuitable brass bolts and double nuts, flat washers & 2nos. bimetallic solder less sockets suitable upto 80 mm^2 conductor.

- **Spacing: -** The minimum clearance between phases to the switch shall be 760mm. Theoperation down rod shall be at a transverse distance of 300mm from the outer limb of theswitch. The centre spacing between two post insulators of the same phase shall be 380mm.In the open position of the A.B. switches the moving blade shall rotate through 90^o. Thisshall be exhibited in the drawing.

- **Sample, Drawing & Literatures: -** Sample of each items 11KV 200 amps. A.B. Switch shall be furnished and three copies of drawings item similar to the sample shall be furnished along with the tender.

- The details of construction and materials of different parts of the A.B. Switch shall clearly be indicate in the tender and illustrative pamphlet / literature for the same shall besubmitted along with the tender.

19.4.6 Test & Test Certificate

- **Type Test: -** Certificate for the following type tests conducted (within five years proceeding to the date of opening of the tender)on a prototype set of A.B. Switch in a NABL approved test house/CPRI shall have to be submitted along with offer.
- **Dielectric Test** (impulse and one minute were power frequency withstand voltage test.)
    i. Temperature rise test (for contracts and terminals)
    ii. Shorts Time current and peak withstand current test.
    iii. Mainly active load breaking capacity test.
    iv. Transformer off-load breaking capacity test.
    v. Line charging breaking capacity test.
    vi. Cable charging breaking test.
    vii. Operation and mechanical endurance test.
    viii. Mechanical strength test for post insulator, as per IS-2444/1937 shall be furnished.
    ix. Test for galvanization of metal (ferrous) parts.

- **Routine /Acceptance Test**
  The inspection may be carried out by the Purchaser at any stage of manufacture. The successful bidder shall grant free access to the Purchaser's representative at a reasonabletime when the work is in progress. The following routine tests shall have to be conductedon each set and results are to be furnished for consideration of deputing

inspecting officerfor inspection and conduction testing of the materials at the works of the manufacturer. The supplier shall give fifteen days advance intimation to the Purchaser to enable him to depute his representative for witnessing the tests.

a. Power frequency voltage dry test.

b. Measurement of resistance of main circuit.

c. Tests to prove satisfactory operation.

d. Dimension Check

e. Galvanization test.

f. Operational test.

19.4.7 Guaranteed Technical Particulars

The bidder shall furnish the guaranteed technical particular duly filled in the format alongwith the tender.

19.4.8 Completeness of Equipment

All fittings, accessories of apparatus which may not have been specifically mentioned in this specification but which are usual or necessary in equipment of similar plat shall be deemed to be included in the specification and shall be supplied by the Tender without extra charge. All plant and equipment shall be completed in all details whether such detailsare mentioned in the specification or not.

19.5 Technical Specifications for Transformer

This specification is intended to cover design manufacture assembly, testing at manufacturer's works, supply and delivery of three phases, 50 Hz, 11/0.433 kV Delta/Star, Vector Group Dyn11 two windings copper wound outdoor type oil immersed naturally air-cooled Transformer is per detail furnished here after.

The transformer offered be complete with all parts and accessories which are necessary or usual for their efficient and satisfactory operation. Such parts and accessories be deemed to be within the scope of this specification whether specifically mentioned or not. Main tank body may be delivered in unpacked condition, but delicate parts like indicating meter,radiator, and conservator. Pressure Relief Valve, equalizer pipe, be packed to avoid damage due to transport, shipment.The equipment and work conform to General Specifications for electrical works of CPWD(Part– I, II, IV) as amended up to date, BSI /IEC and relevant Indian Electricity rules, Indian Electricity Act 2003 and other relevant regulations with statutory regulation and safety codes that is related to the work.

19.5.1 Location

The equipment supplied be suitable for satisfactory performance for the rated capacity atall weather conditions in summer, monsoon, and winter at Sambalpur, Odisha as under: -

(a) Altitude: less than 1,000 mtr.

(b) Max. ambient air temp: 50°C

(c) Max. daily average ambient air temp: 40°C

(d) Max. yearly weighted average ambient temp: 32°C

(e) Min. yearly weighted average ambient temp: -5°C

(f) Temp. rise at the above conditions:

(g) By resistance method: 55°C (Max. temp. being 95°C)

(h) By Thermometer: 50°

(i) By Maximum Humidity: 79%

(j) Seismic Zone: III

19.5.2 System details

11 kV system is Non- Effectively Earthed, whereas 433 V Systems is to the Effectively Earthed at Neutral Point of the Star Connected Windings of the Transformer.

19.5.3 Applicable standards

Unless otherwise stated, transformer be designed, constructed, and tested in accordance withprovisions contained in latest revisions of following Indian standards and Rule

- IS 1180 (part 1): 2014 (Level 2)
- REC Manual 10/1976.
- C B.I.P Manual on Transformer Technical Report 1: Section A.D: (Revised: 1987)
- C.B.I.P Technical Report No 72 (June 1989)
- C.B.I.P Publication 295 - 2007
- Indian Electricity Rules, 1953 (Amended up to date)
- other applicable Indian Standards.

19.5.4 Deviations from specifications

The deviations from the purchaser's specification to improve utility, performance and efficiency of equipment or to secure overall economy be considered if such deviations(s) is (are) mentioned by the Tenderer in the "Schedule of Deviations" with full justification.

19.5.5 Rating and general particulars Type

Core Type, Three Phase. Oil immersed step-down two winding copper wound transformer for outdoor installation.

19.5.6 Standard Rating

Off Circuit Tap Changer as Mentioned in the Schedule of Quantities.

19.5.7 Continuous Maximum Rating and Temperature rise

As regards maximum rating and temperature rise, all transformers comply with the appropriate requirement of Indian Standards

To consideration of maximum temperature rise of oil and winding the following ambient temperature are assumed.

Cooling medium	:	Air
Maximum Ambient Air temperature	:	50°C
Maximum daily average ambient Air temperature	:	40°C
Maximum yearly weighted average temperature	:	32°C.

With the above Ambient Temperature Condition Allowable Maximum Temperature Rise be

As Mentioned Below

Type of Cooling	Oil in °C	Winding in °C
ONAN	40	45

No load voltage ratio

The No Load Voltage Ratio Corresponding to Principal (Normal) Tapping be 11000/433Volts Winding Connections and Vector Group etc.

i. Number of phases : Three
ii. Frequency : 50 HZ
iii. Type of Cooling : ONAN
iv. Winding connections : The primary winding (HV) be connected in delta andsecondary winding (LV) be connected in star.
v. Vector Group : Windings be connected as per Vector symbol Dyn11 of Indian Standards to produce a punitive displacement of 30 Deg. from the primary to the secondary vectors of the same phase assuming vector rotation counterclockwise.
vi. Neutral Earthing : The neutral point of the secondary (LV) winding be brought out to a separate insulated terminal and he solidly earthed.

19.5.8 Taps

Transformer be provided with off load taps ranging from +5% to -10% in steps of 2.5% each on H.V winding for H.V. variation. The tap changing switch be in a convenient position so that it can he Operated from Ground level. The Control Box be provided with Tap Position Indication & Locking Arrangement.

Technical Specification of Off Load Tap Changer to be supplied with 200 kVA 11kV/433 V Transformer

- The Off-load tap changer be designed suitable for local manual as well as local

electrical operation

- An oil immersed tap selector and arching switch or are suppressing tap selector, provided with reactor or resistor for reduction of make and break arcing voltages and short circuits
- Control and protection devices.
- Manual/Electrical operating device.

A suitable pressure reliving arrangement should be provided to take care to sudden pressurerise in compartment.

The manual operating device be so located on transformer that it can be operated by a man standing at the level of transformer track. It is strong and robust in construction.

19.5.9 Impedance Value

The percentage impedance be as follows

S No.	Rating	Voltage Ratio	% Impedance
1.	200 kVA	11 kV/433 V	4.5 or as per manufacturer's Data

The impedance value refers to the (normal) principal tapping are subject to a tolerance of ±10%

19.5.10 Terminal

Cable Box on HV & LV Sides for Cable Termination

19.5.11 Short circuit level

Designed maximum fault level of 11 kV and 21 kA for 3sec or as per IS

19.5.12 Insulation level

Insulation Level be as per IS

19.5.13 Cores

The Cores be constructed from high grade cold rolled non-aging grain-oriented silicon steel laminations having magnate coating as insulation. The core thickness shall be 27 microns

Successful bidder will offer the Core for inspection and/or approval by the purchaser during the manufacturing stage. Manufacturer's Call notice for the purpose should be accompanied with the following as applicable as a proof towards use of Prime Core materials:

i. Invoice of supplier

ii. Mill's Test Certificate

iii. Packing Lists

iv. Bill of Lading

v. Bill of entry Certificate to Customs

Core materials be procured either from the core manufacturer or through their accredited marketing organization of repute.

Tendered should preferably have in-house Core cutting facility for proper monitoring and Control on quality.

The materials used for insulation have high interred lamination resistance and rust inhibiting property. It not deteriorates by aging from hottest operating temperature and clamping pressure of the core or disintegrate due to core vibration. It not has any tendency to absorb moisture or to react with insulating oil.

The assembled core be securely clamped on the limbs and yoke with uniform pressure to minimize noise emission from it.

The top main core clamping structure be connected to the tank body by a copper strip. The bottom clamping structure be earthed by one or more of the following methods (i) by connecting through vertical tie rods to the top structure (ii) by direct metal to metal contact with the tank base by the weight of the core and winding (iii) by a connection to the top structure on the same side of core as the main earth connection to the tank.

All parts of the cores be robust design capable of withstanding any shock, to which they may be subjected during lifting, transport, installation, and service.

Adequate lifting lugs be provided to enable the core and winding to be lifted.

Adequate provision be made to prevent movement of the core and winding relative to the tank during transport and installation or while in service.

The supporting framework of the cores be so designed as to avoid the presence of pockets which would prevent complete emptying of the tank through the drain valve or cause trapping of air during filling.

The insulation structure for the core to bolts and core to clamp plates be such as to withstand a voltage of 2000 V AC at 50HZ for one minute.

19.5.14 Flux density of core

Flux Density at rated voltage and frequency shall not exceed 1.69 tesla or as per latest IndianStandards.

The No load current shall not exceed 1.5 % of the full load current.
The no load current shallnot exceed 3 % of the full load current in L.
V. Winding when the applied voltage is 112.5%

19.5.15 Winding

- All windings shall be electrolytic copper (99.9% purity) be fully insulated.
- Transformer be designed to withstand the impulse and power frequency test voltages
- The windings be designed to reduce to a minimum the out of balance forces in the transformer at all voltage ratios.
- The insulation of transformer winding and connections be free from insulating material liable to soften, ooze out, shrink or collapse and be non-catalytic and chemically inactive to transformer oil during service.
- The stacks of windings receive adequate shrinkage treatment before final assembly. Adjustable device be provided for taking up any possible shrinkage of coils in service.
- All the insulating material to be used in the transformer preferably be of class - A insulation as specified in Indian Standards, the test certificate of the materials be made available by the transformer manufacturer on request during inspection and testing
- The coil clamping arrangement and the finished dimensions of any oil ducts be such that it will not impede the free circulation of oil through the ducts.
- The windings and connections of transformer be braced to withstand shocks which may occur during transport or due to switching short circuit and other transient conditions during service.
- Coil clamping rings, if provided, be of steel or suitable insulating material. Axially laminated material other than Bakelite paper not be used.

19.5.16 Inter earthing arrangements:

All metal parts of the transformer except for the individual core laminations, core bolts and associated individual clamping plates be maintained at fixed potential.

19.5.17 Earthing of core clamping structure:

Core clamping structure be earthed as specified in clamping section above.

19.5.18 Earthing of coil clamping rings:

Where coil clamping rings are of metal at earth potential each ring be connected to the adjacent core clamping structure on the same side of transformer as the main earth connection.

The Total number of earth electrodes shall be 4 (2 for neutral and 2 for connection to

a common earth bus for body earthing) in two different places

19.5.19 Tanks

Tank Pressure be as per Manufacturer Standard and comply the latest IS Standard

Construction:

The Transformer tank and cover be fabricated from good commercial grade low carbon steel suitable for welding and of adequate thickness. The tanks of all transformers be complete with all accessories and be designed so as to allow the complete transformer in the tank andfilled with oil, to be lifted by crane or jacks, transported by- rail, road without overstraining any joint and without causing subsequent leakage of oil.

The main tank body be capable of withstanding vacuum gauge pressure 68 kN/sq. m (500 mm. of Hg). The under carriage of the tank be made of channel of suitable size and design.

The base of each tank be so designed that it be possible to move the complete transformer unit by skidding in any direction without injury when using plate or rails. Where the base is at a channel construction. It be designed to prevent retention of water.

Tank stiffeners be deigned to prevent retention of water. Wherever possible the transformer tank and its accessories be designed without pockets wherein gas may accumulate. Where pockets cannot be avoided, pipes be provided to vent the gas into the main expansion pipe

All joints other than those which may have to be broken be welded when required they be double welded. All bolted joints to the tank be fitted with suitable oil tight gaskets which give satisfactory service under the operating conditions and guaranteed temperature rise conditions. Special attention be given to the methods of making hot oil tight joints between the tank and the cover as also between the cover and busing and all other outlets to ensure that the joints can be remade at site satisfactorily.

Tank cover

Each tank cover be of adequate strength and not distort when lifted. Inspection openings be provided as necessary to give easy access to bushings or changing ratio or testing the earth connection. Each inspection opening be of ample size for the purpose for which it is provided.

The tank cover and inspection cover be provided with suitable lifting arrangement.

The tank cover be fitted with pockets for thermometer and for the bulbs of oil and winding temperature indicators. The thermometer pocket be fitted with a captive screwed top to prevent the ingress of water. Protection be provided, where necessary for each capillary tube. The pocket be in the position of maximum oil temperature and it be possible to remove the instrument bulbs without lowering the oil in the tank. Turrets should provide on tank cover to house the bushing. The tuners of both HV &

LV bushings should be connected through pipes with main tank pipe to drive out trapped air or should have air release plug to drive out trapped air.

Conservator vessels

The conservator should be normal type to prevent direct contact of Transformer oil with atmospheric air for retarding oxidation and contamination of oil. The air cell be made from suitable material with inner coating resistant to transformer oil & outer coating resistant to ozone & weathering.

The conservator be provided with necessary valves to drive out the air in the space between conservator wall & air cell during filling of oil drain valves for complete draining of oil and cut off valves etc.

The conservator completes with necessary valves be provided in such a position as not to obstruct the electrical connections to the transformer from H.V& LV. SIDE.

The conservator to have a capacity to meet the requirement of expansion of the total cold oil volume in the Transformer & cooling equipment.

The conservator be designed so that it can drain oil completely by means of the drain valve provided when mounted. One end of the conservator be bolted into position so that it can be removed for cleaning purpose.

Oil Gauges

Normally one Magnetic type oil gauge be provided. The oil level at 30°C be marked on the gauge

Connection

The oil connection from the transformer tank to the conservator vessel be arranged at a raising angel of 3° to 9°C to the horizontal and consist of pipe with inside diameter 50 mm/80 mm as per capacity of the transformer and as per IS : 3639. Two valves be provided between the conservator and transformer main tank to cut off the oil supply to the transformer after providing a straight run of pipe for at least a length of five times the internal diameter of the pipe on the tank side of the gas and oil actuated relay and at least three times the internal diameter of the pipe on the conservator side of the gas and oil actuated relay. The valves should be fitted on both sides of the Gas and Oil actuated Relay.

Breather

Conservator vessel be fitted with a glass container type breather in which silica gel is dehydrating agent and so designed that:

i. The passage of air through the silica gel
ii. The external atmosphere is not continuously in contact with the silica gel
iii. he moisture absorption indicated by a change in colour of the tinted crystals can be easily observed from the distance
iv. breather be mounted at approximately 1400 mm above ground level and be connected to the air cell of the conservator through pipe for the

purpose of breathing during contractionor expansion of the air cell

Bushings

Pollution free type insulator should be used for the bushings. The bushing should be locatedon suitable turrets (with air release plugs). Adjustable arcing horns should be provided on theBushings; Bushings of identical voltage rating be interchangeable. All bushings be equippedwith suitable terminals of approved type size and be suitable for bimetallic connections

The bushings have high factor of safety against leakage to ground and so located as to provide adequate electrical clearance between bushing and grounded parts.

Both HV & LV Bushing should be suitable for use in heavily polluted atmosphere as per IS 2099 & IS 3347. 3 Nos. H.V Bushings & 4 Nos. L.V. Bushing should be supplied with the transformer.

Filter, drain valves, sampling devices and air release plugs Each transformer be fitted with the following

- A drain valves as specified below be fitted to each conservator for diameter up to 650 mm:Size of the valve 15 mm: for diameter above 650 mm: Size of the valve 25 mm.
- Suitable oil sampling device be provided at the top and bottom of the main tank. The sampling device is not fitted on the filter valves specified under (ii) above
- One 15 mm air release plug on the main tank of the transformer
-
- All other valves opening to atmosphere be fitted with blank flanges.

Radiator

Radiators be so designed as to avoid pockets in which moisture may collect and withstandthe pressure tests. The radiator tubes / fins be seamless, made of mild steel having minimum wall thickness of approx. 1.0 mm and a clean bright internal surface free from dust and scaleThey be suitably braced to protect them from mechanical shocks, normally met in transportation and to damp the modes of vibration transmitted by the active part of the transformer in service. Each cooler unit have a lifting eye.

The butterfly or similar metal valves be provided for isolating detachable radiator assembly. One cock each at the bottom of radiator stack be provided for draining oil from radiator stacks.

Air release plug each at the top of radiator stack be provided for release of locked air from radiator stack. Removable blanking plates be provided to permit the blanking off main oil connection of each cooler. Radiator fixing bands in top & bottom of radiators to be provided to minimize the vibration of the same.

Lifting and haulage facilities Each tank be provided with

i. Lifting lugs suitable for lifting of transformer complete with oil.
    a. A minimum of four jacking lugs, in accessible positions to enable the transformer to complete with oil to be raised or lowered using hydraulic or

screw jacks. The minimum height of the lugs above the base

b. Transformer up to and including 10 tonnes weight -300 mm.
c. Transformer above 10 tonnes weight – 500 mm

ii. Suitable haulage holes be provided

Insulating oil

The transformer and all associated oil filled equipment be supplied complete with insulatingnew oil required for first filling including 10% extra oil for future use during commissioning.The transformer tank be dispatched filled oil and the balance oil be supplied in non-returnablesealed drums along with the Transformers.

The insulating oil conform to the requirement of IS: 335: 1993.

Pressure relief device

Pressure relief device be provided with A/T Contact of sufficient sizes for rapid release of any pressure that may be generated within the tank, and which might result in damage to the equipment. The device operates at a static pressure of less than the hydraulic test pressure for transformer tank. Means be provided to prevent ingress of rain. It shall be mounted on the cover of the main tank and be designed to prevent gas accumulation. Spring loaded setting type Pressure Relief Valve having suitable opening Port hole according to the capacity of the Transformers should be provided. The Pressure Relief Valve should have provision of visual indication for opening of the valve.

Axis and wheels

The Transformer be provided with flanged bidirectional wheels as mentioned below Transformer rating in kVA Type Flanged wheel suitable for use on a 1,435 mm / 1676 mm gauge track.

The wheels be suitable for being turned through an angle of 90°C and locked in that position when the tank is jacked up. All wheels be detachable and be made of Cast iron or Steel. Suitable locking arrangement be provided to prevent the accidental movement of the transformer.

Painting

Before painting or filling with oil all metallic parts be completely cleaned and free from rust, scale and grease and all external surface cavities on castings be filed by metal deposition

The interior of al transformer tank and other oil filled chambers and internal structure steel work be thoroughly cleaned of all scale and rust by sand blasting or other approved method. These surfaces be painted with hot Oil resisting varnish or paint. Unexposed weld need not be painted.

Except for nuts, bolts, and washers, which may have to be removed for maintenance

purposes all external surface receives a minimum of three coats of paint.

The primary coat be applied immediately after cleaning. The second coat be of oil paint of weather resisting nature and preferably of a shade or colour easily distinguishable from the primary and final coats be applied after the primary coats have been touched up where necessary. The final coat be of a glossy oil and weather resisting non-fading paint of Dark Admiralty Grey shade no. 632 of IS:5. Primer paint be ready-made zinc chrome as per IS: 104: intermediate and final costs of paint be as per IS: 2932.

All interior surfaces of mechanism chambers and kiosks except those which have received anti-corrosion treatment receive three coats of paint applied to the thoroughly cleaned metal surface as per procedure mentioned above. The final coat be of a light-coloured anti- condensation mixture.

Any damage to paint work incurred during delivery be made good by the manufacturer by thoroughly cleaning the damage portion and applying the full number of coats of paint that had been applied before the damage caused.

Earthing terminal

Two earthing terminals capable of carrying the full amount of lower voltage short circuit current of transformer continuously for a period of 5 second provisions be made at positions close to each of the bottom two corners of the tank for bolting the earthing terminals to the tank structure to suit local conditions.

Temperature indicating devices

Oil temperature indicator with one electrical contact be provided with anti-vibration mounting. The oil temperature indicator be housed in the marring box.

The winding temperature indicator with two electrical contacts for alarm and trip purposes be provided with anti-vibration mounting. The winding temperature indicator be housed in the marring box.

The oil and winding temperature indicator should be of renowned make preferably of “Perfect Control”. The scale on the dial of the thermometer should be 0°C to 150°C. The angular displacement of thermometer should be 270.

The tripping contracts of indicator be adjustable to close the winding temperature indicator between 60°C and 120°C. The alarm contacts of indicator be adjustable to close between 30°C & 50°C.

All contacts be adjustable on a scale and be accessible on removal of the cover. The Temperature indicators be so designed that it shall be possible to check the operation of contacts and associated equipment.

For measuring winding temperature, a hearer coil fed from a C.T. (Current transformer) must be provided on the pocket for winding temperature indicator bulb. The connection from C.T. to heater should be through a link arrangement on tank cover suitably housed in a weatherproof box so that C.T. current and heated coil resistance can be checked.

Rating diagram

The following plates shall be fixed to the transformer tank at a suitable height so that the particulars could be read by standing at ground level.

- A rating plate bearing the date specified in the relevant clause of IS: 2026 including figures of temperature rise of oil and winding and high voltage test values.
- A diagram plate showing the internal numbering of taps, tapping switch connection of windings and the voltages vector relationship in accordance with IS:2026 and in addition a plan view of the transformer giving the correct physical relationship of the terminals. No loadvoltage be indicated for each tap. the losses should be mentioned with impedances

The centre of gravity

The centre of gravity of the assembled transformer shall be low and as near the vertical centreline as possible. The transformer shall be stable with or without oil. If the centre of gravity iseccentric relative to track either with or without oil, its location shall be shown on the outline drawing

Operation

The transformer shall be suitable for operating in Board's Sub independently or in parallel with one or more transformers.

Duty under fault conditions

It is to be assumed that normal voltage will be maintained on one side of the transformer when there is a short circuit between phases or to earth on the other side. The transformer may be directly connected to an underground or overhead line and may be switched into and out of service together with or without its associated incoming / outgoing line.

The thermal ability to withstand short circuit be 21kA for 3 sec without injury for 3 phase dead short circuit at the terminal.

Rated voltage of operating device

Rated voltage for indicating and operative device be 24 volts DC /230 volts AC with variations as specified in the relevant IS.

Foundation

The Contractor shall furnish foundation plan of the transformer showing the fixing arrangement of the transformer so that the purchase may be able to finalize the foundation drawing.

Tests and inspection Routing Test

All transformer shall be subjected to the following routing tests at the manufacturers work. The test be carried out in accordance with the details specified in IS: 1180 Part 1 (Level 2)

i. Measurement of winding resistance

ii. Measurement of voltage ratio and check of polarity, voltage vector relationship

iii. Measurement of impedance voltage / short circuit impedance

iv. Measurement of load loss

v. Measurement of no-load loss and no-load current

vi. Measurement of insulation resistance.

vii. No Load and Load Losses

viii. Impedance Voltage

ix. Induced over voltage withstand test.

x. Separate source voltage withstands test.

xi. Heat Run Test/Temperature rise test (Test not to be Conducted, Only calculation Certificate Should be Provided By Manufacturers)

xii. Measurement of unbalance current and magnetizing current test at 110% rated voltage and frequency

xiii. Testing of neutral CT in accordance with provisions in the relevant IS.

xiv. Oil BDV Test

xv. HV Test

xvi. Insulation Test

xvii. Continuity Test

Type and special tests.

In addition to routing tests mentioned above the transformer shall be subjected to all kinds oftype and acceptance tests in accordance with relevant ISS (IS: 2026)

If type tests have successfully been carried out earlier in compliance with the provisions madein the relevant IS from a recognized institution then the copy of the same in triplicate be furnished along with the tender papers in respect of each of kind of transformer.

If Type tests have not yet been carried out, then the manufacturer have to do so at their owncost. Owner if feels, may depute their representative to witness the said Type Tests etc. Themanufacturer arranges all facilities for such inspection and tests free of cost.

Inspection and testing

Inspection & Testing as already mentioned the equipment be subjected to routine and other acceptance tests as per provisions in the relevant IS.

The Engineer-In-Charge reserves the right to send its Engineers if so desires to witness manufacturing process and to reject either raw materials or finished products found to be not complying with the requirement of the specification and also have the right to select any/all equipment from the lot offered for tests.

The manufacturer shall give at least (21) twenty-one days' advance notice regarding readiness of such inspection and testing and submit six set of the works test certificates of the material / equipment offered for inspection and testing indicating probable date of inspection and testing.

The supplier shall arrange all possible facilities for such inspection and testing at any lane during manufacture free of cost.

Test certificates

Seven copies of the approved Test certificates as mentioned above are to be furnished to the Owner before dispatch of the equipment.

Drawing and manuals

The following drawings and details shall be furnished in triplicate along with the tender:

i. General Arrangement outline drawing with plan, elevation and end views showing various dimensions of transformer and its vital component including height of the bottom most portion of bushing from the bottom of base channel and also indicating thereon physical center line and position of center of gravity.
ii. Three copies of sketches for height of crane hook above ground for lifting and undertaking core, shipping dimensions, complete lists of fittings and devices, net weights of core, winding, tank, radiator, oil, conservator and total weight, fixing arrangement of transformer in foundation.
iii. Installation, operation, and maintenance manual.
iv. The following drawings and manuals in six sets shall be submitted for approval within 15 (fifteen) days from dale of placement of LOI / ORDER.

- Cross sectional details with plan, elevation and views showing all internal clearances.
- Drawing of Name & rating plate
- Drawing of diagram
- Installation, operation and maintenance manual of transformer, associated equipment liketemperature indication, oil level indicator etc.

The manual clearly indicates the installation method, check-ups and tests to be carried outbefore and after commissioning of the transformer.

Guaranteed technical particulars:
Tenderers shall furnish guaranteed technical particulars of equipment offered as per Schedule 'B' Performance Guarantee shall be based on guaranteed technical particulars.

Short circuit calculations
Manufacturer shall submit theoretical calculations in support of the ability to withstand short circuit on consideration of highest value that may attain in triplicate within 15 (fifteen) days from the date of placement of L.O.I./Order.

Performance certificates
Copies of performance certificates of similar Equipment supplied to various organizations have to be furnished along with Tender

Credentials
Tenderer shall furnish documents in support, delivery, of similar equipment indicating thereon names of the organization quantity ordered, quality supplied along with tender.

Deviations
All deviations from the specifications shall be recorded in the "Deviation Sheet" with reference to respective clauses of the Specification by drawing Specification for the same. Unless deviations are recorded in the Deviation Sheet and submitted with the offer, it will be taken for granted that the offer is made in conformity with Specification.

Spare parts
The Contractor shall submit a recommended list of spare parts for five years of operation along with item wise price for each item of spares.s

Validity period
Validity period of the offer be reckoned from the date of opening of tender provided it is technically and commercially complete one. Otherwise, it will be counted from the date of receipt of complete information.

Transformer fitting & accessories /Spares
All screw threads and nuts shall be made as per ISS and all valves shall be of standard tested quality and leak proof.
The following fittings and accessories shall be supplied with each transformer

1. Outdoor type bushing – HV-3 Nos. and LV-4 Nos.
2. Normal Type Conservator
3. Conservator drain valve
4. Dial type oil level indicator complete with alarm contact.
5. Silicate breather with oil seal and connecting pipe. The breath shall be accessible for inspection from ground.
6. Access / inspection holes with bolted cover for access to inner ends of

bushing
7. Cover lifting eyes
8. Lifting eyes for core frame with windings
9. Off load tap changing arrangement
10. Air release plugs on top of cover and hushing turrets.
11. Upper filter valve and bottom filter valve.
12. Drain valve
13. Top and bottom oil sampling devices. Provision for oil sample collection during process of filtration should be made.
14. Lifting lugs
15. Jacking pads with handling holes at tour corners.
16. Transport lugs.
17. Undercarriage base channel.
18. Tank earthing terminal - 2 Nos
19. Dial thermometer for winding temperature with alarm contacts and trip contacts.
20. Dial thermometer for oil temperature with alarm contacts.
21. An additional pocket for insetting thermometer for oil temperature indication
22. Weatherproof control cabinet for Marshalling terminal connections from protective and indicative devices. The cabinet be provided with incandescent filament lighting, plugs tic.
23. Neutral C.T. in LV side of Power Transformer.
24. Rating plate as per ISS
25. Diagram Plate
26. LT cable box with extended bus bar for terminations

20. GNERAL

All civil, electrical, Horticulture & Landscaping works, even if not specified above, shall be executed strictly in accordance with the CPWD specifications corrected up to date at the time of tenders, unless specified to contrary, as given below:

A. Civil Works Specifications

- CPWD Specification Volume-I – 2019
- CPWD Specifications Volume-II – 2019

B. Electrical Works Specifications

- General Specifications for Heating, Ventilation & Air-Conditioning (HVAC)
- CPWD General Specifications for Electrical Works
  - Part-I : Internal (Latest)
  - Part-II : External (Latest)
  - Part-III : Lift & Escalators (Latest)
  - Part-IV : Sub-Station (Latest)
  - Part-V : Wet Riser & Sprinkler System (Latest)
  - Part-VI : Fire Detection and Alarm System (Latest)
  - Part-VII : DG Sets (Latest)
  - Part-VIII : Gas Based Fire Extinguisher System (Latest)

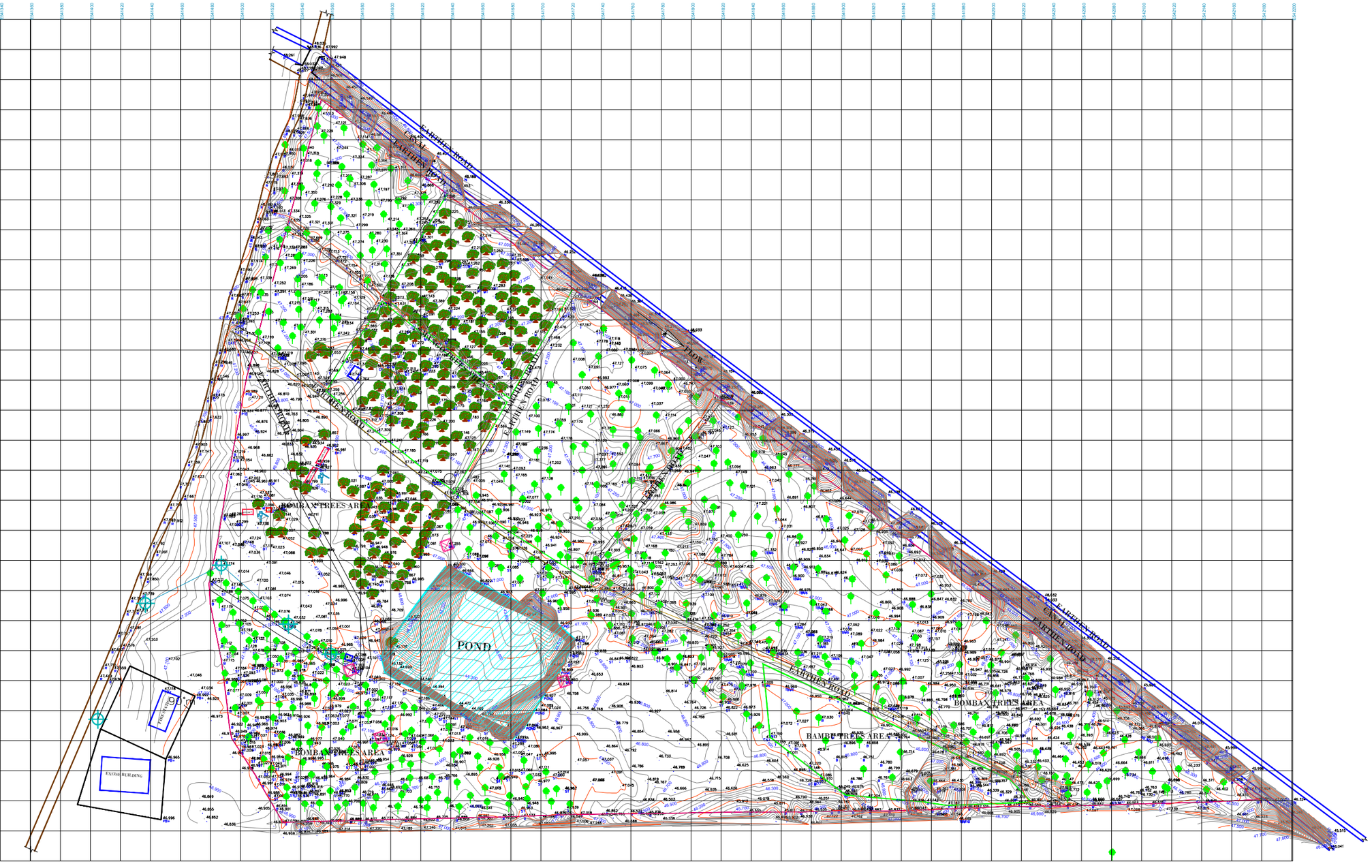
C. Horticulture & Landscaping Specification (Latest)

D. In case of non-availability of specification in the above CPWD specifications, the Contractor shall follows the BIS Standards for the execution of items.

SECTION – IX

Tender Drawings

TOPOGRAPHICAL SURVEY



N

TOTAL AREA : 172241.228m

= : 42.56ACRES

GRID INTERVAL : 20.00 x 20.00 M.
CONTOUR INTERVAL : 0.10 M.

NOTES :

ALL DIMENSIONS ARE IN METERS

ALL LEVELS ARE IN METERS.

LEGEND

NAME	SYMBOLS
FENCING	
BUILDINGS	
HAND PUMP	
ELECTRIC POLE	
WELL	
PAINTED ROAD	
RCC BRIDGE	
PLANTATION	
CONTOUR	
CONTOUR LEVEL	47.5
TREE	
SPOT LEVEL	
BANC H MARCK	
CULVERT	
POND	
ELECTRIC LINE	
EARTHEN ROAD	
BAMBU HUT AREA	
DATE	3/4/2023

IMPLEMENTATION AGENCY:

WAPCOS Ltd.

(A GOVERNMENT OF INDIA UNDERTAKING)

CLIENT:

SASHATRA SEEMA BAL

PROJECT:

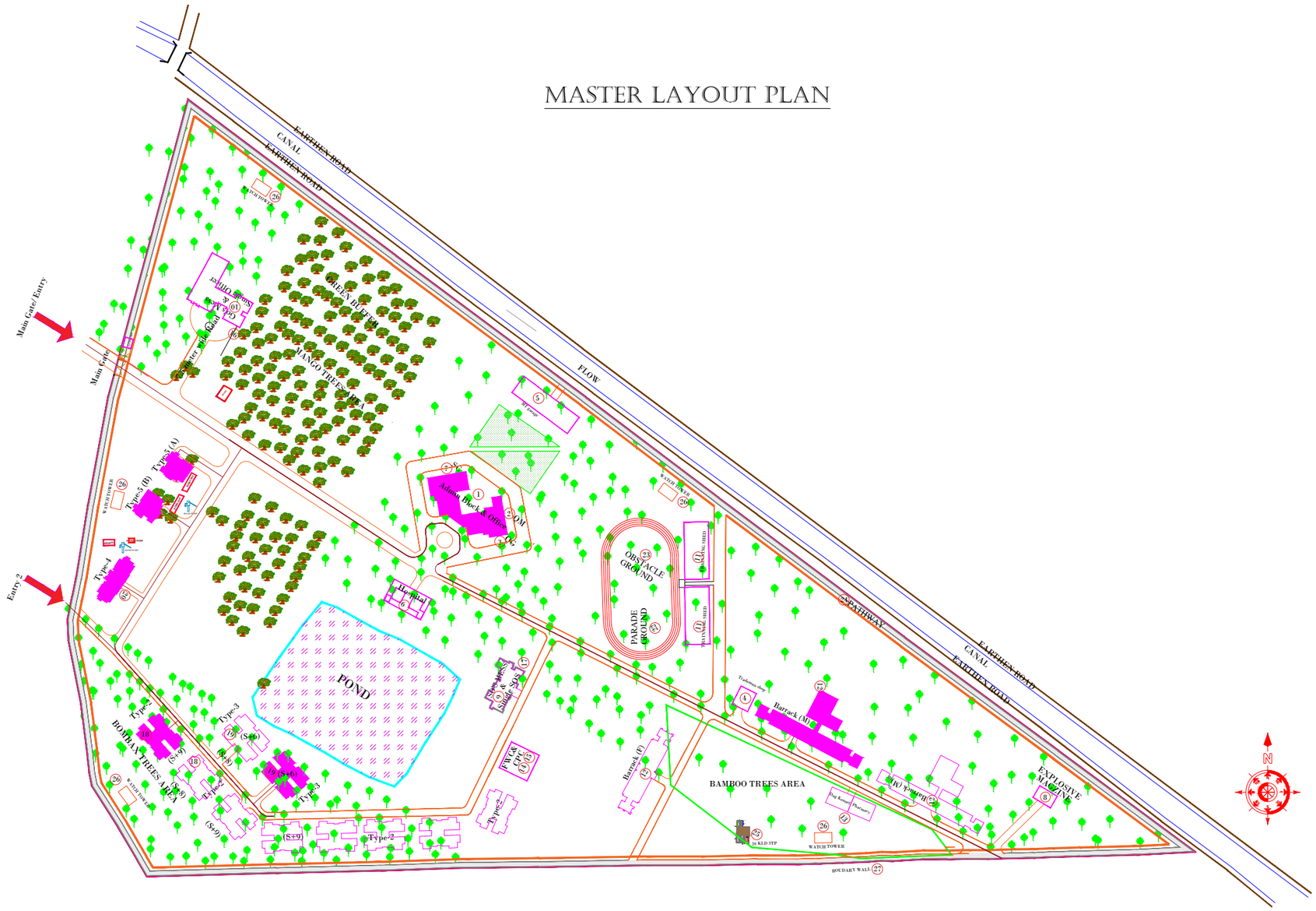
CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN HQRS SSB, ARIRIYA, BIHAR

TITLE:

TOPOGRAPHICAL SURVEY SHEET

FOR TENDER PURPOSE ONLY

MASTER LAYOUT PLAN



SITE AREA= 42.38 ACRES

NO.	BLOCK NAME	AUTHORIZED PLINTH AREA	PROPOSED PLINTH AREA	TOTAL NO. OF FLOORS
1	ADMIN	1398.23 SQ.M.	1398.23 SQ.M.	Stilt+2
	OFFICES	1082.25SQ.M.	1082.25SQ.M.	Stilt+2
2	STORES	712.23SQ.M.	0.0SQ.M.	G+1
3	QUARTER GUARD	527.83SQ.M.	0.0SQ.M.	GROUND FLOOR
4	TRADESMAN SHOP	131.13SQ.M.	0.0SQ.M.	GROUND FLOOR
5	MT GARAGE	606.88SQ.M.	0.0SQ.M.	GROUND
6	HOSPITAL	742.57SQ.M.	742SQ.M.	GROUND
7	SERVICE COY	327.99SQ.M.	0.0SQ.M.	GROUND
8	EXPLOSIVE MAGAZINE	88.48SQ.M.	0.0SQ.M.	GROUND FLOOR
9	SO'S MESS	426.58SQ.M.	0.0SQ.M.	G+1
10	GO'S MESS	631.97SQ.M.	0.0SQ.M.	G+1
11	TRAINING SHED	371.75SQ.M.	0.0SQ.M.	GROUND
12	180 MEN / WOMEN BARRACK	6267.50SQ.M.	2228.40SQ.M.	G+4(128 MEN PHASE-1)
13	DOG KENNEL & PHARMACY (5 DOGS)	284SQ.M.	0.0SQ.M.	GROUND FLOOR
14	CPC	200SQ.M.	0.0SQ.M.	GROUND
15	FWC	500SQ.M.	0.0SQ.M.	GROUND
16	SINGLE OFFICER	353.59SQ.M.	0.0SQ.M.	GROUND
17	SINGLE SOS	398.14SQ.M.	0.0SQ.M.	G+1
18	TYPE-II 269/64 NOS.	16126.55SQ.M	4480SQ.M.	Stilt+9 (1 NOS. PHASE- 1)
19	TYPE-III 45/24 NOS.	3258SQ.M.	1920SQ.M.	Stilt+6 (1 NOS. PHASE-1)
20	TYPE-IV 6NOS.	602.4SQ.M.	768SQ.M.	Stilt+3
21	TYPE-V 2NOS.	398.4SQ.M.	401SQ.M.	G
22	PARADE GROUND	AS ACTUAL	0.0SQ.M.	GROUND
23	OBSTACLE GROUND	AS ACTUAL	-	GROUND
24	PATHWAY	AS ACTUAL	-	GROUND
25	STP	AS ACTUAL	-	GROUND
26	WATCH TOWER	AS ACTUAL	-	GROUND
27	BOUNDARY WALL	AS ACTUAL	-	GROUND

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

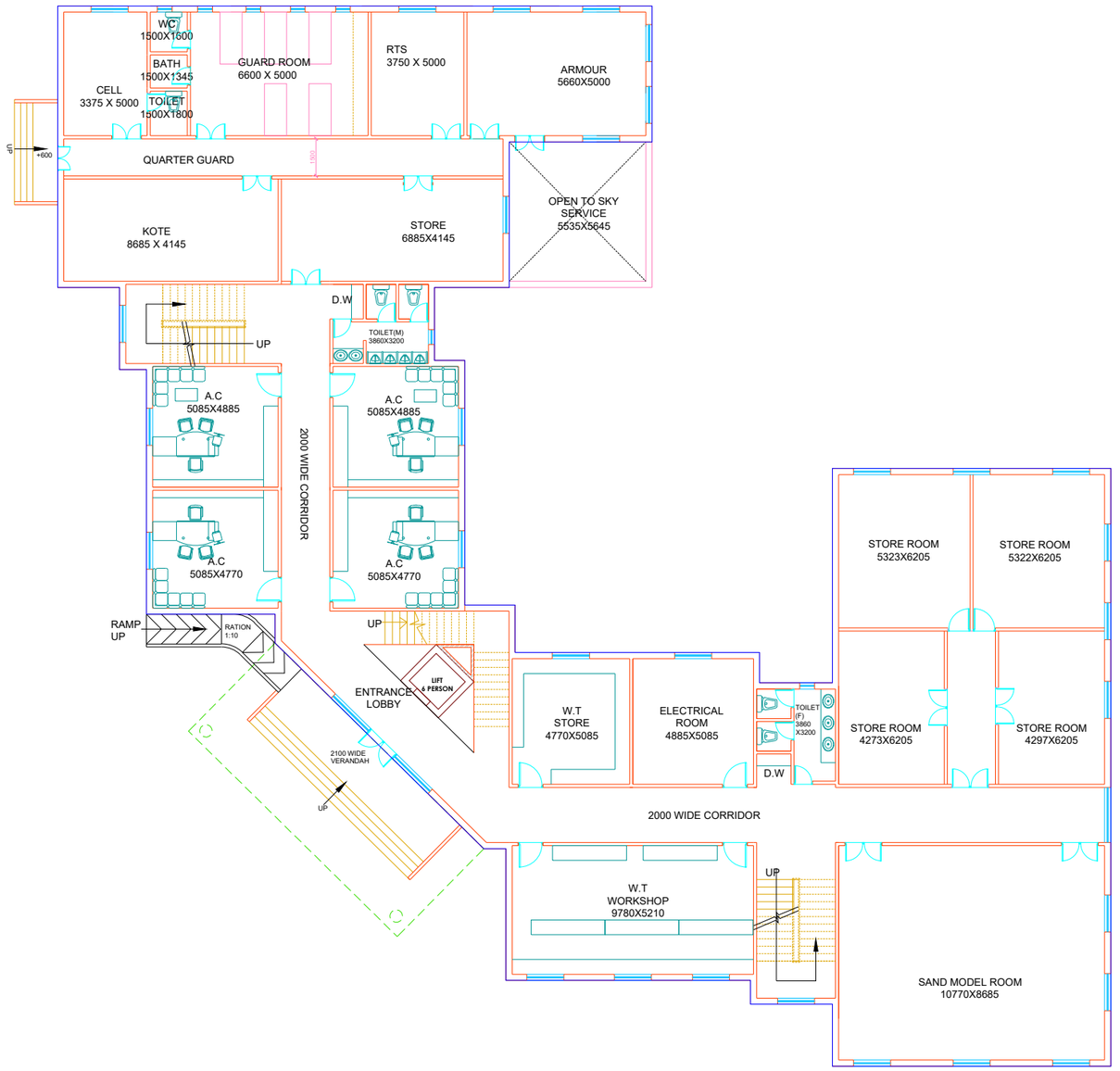
PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

DATE	SCALE	TITLE: LAYOUT PLAN
27.03.2024	NTS	
DEPT:	ARCH	
DRN BY:		
CHK BY:		
APP BY:		
JOB NO.		DOCUMENT ID / REV. R0

FOR TENDER PURPOSE ONLY



GROUND FLOOR PLAN

OFFICE CUM ADMIN BLOCK

GROUND AREA - 913.5 SQ.M.
FIRST FLOOR AREA - 967.2 SQ.M.
SECOND FLOOR AREA
- 606.2 SQ.M.
PORCH AREA - 59.29 SQ.M.
TOTAL AREA - 2546.19 SQ.M.

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

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DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
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WAPCOS

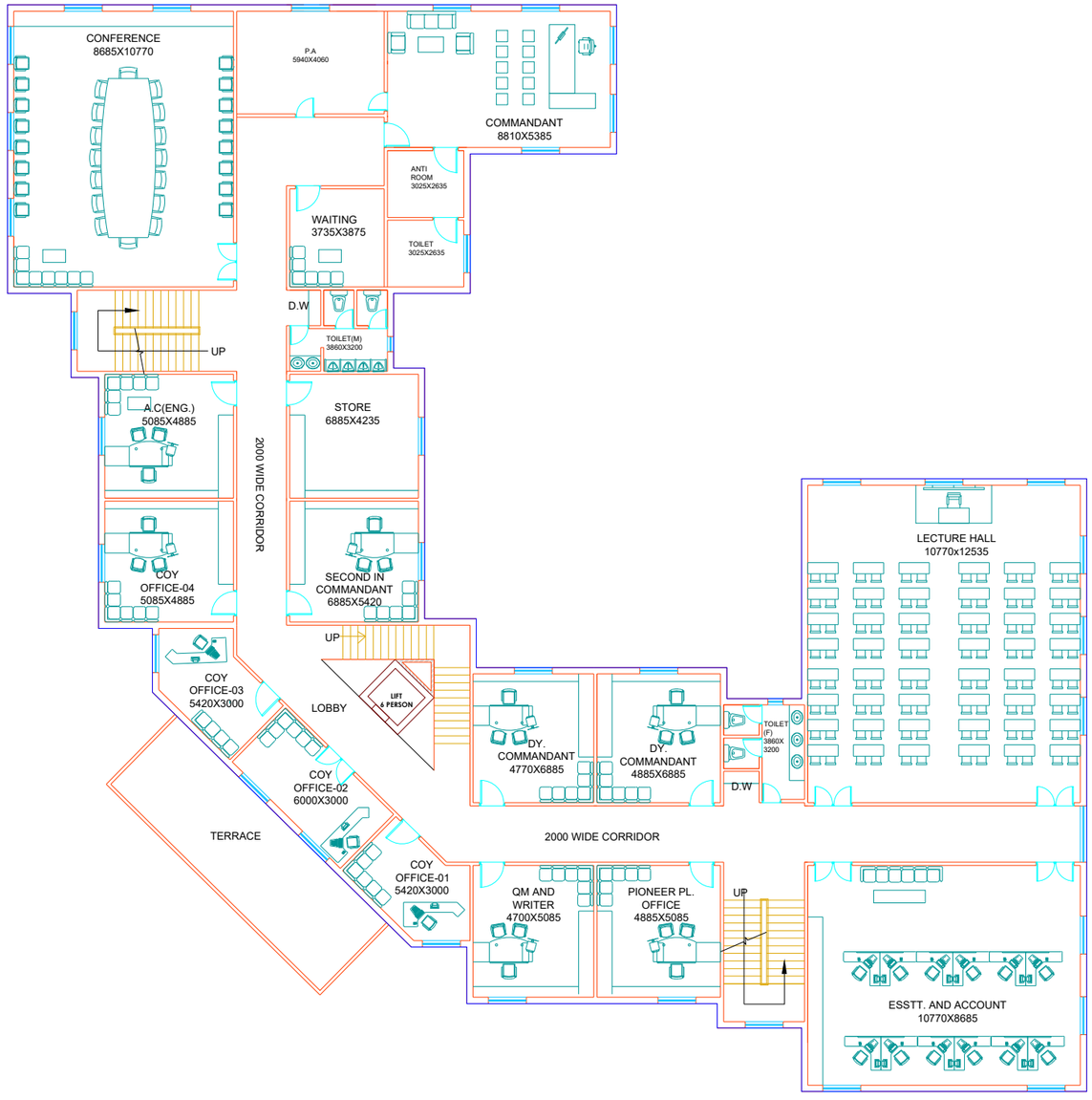
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APP BY:	
JOB NO.	

TITLE:
OFFICE & ADMIN BLOCK
GROUND FLOOR PLAN

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



FIRST FLOOR PLAN

OFFICE CUM ADMIN BLOCK

FIRST FLOOR AREA - 967.2 SQ.M.

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT

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OWNER

DIRCTORATE GENERAL, SSB (Govt. of India, MHA) East Block - V, R.K.Puram, New Delhi- 110066

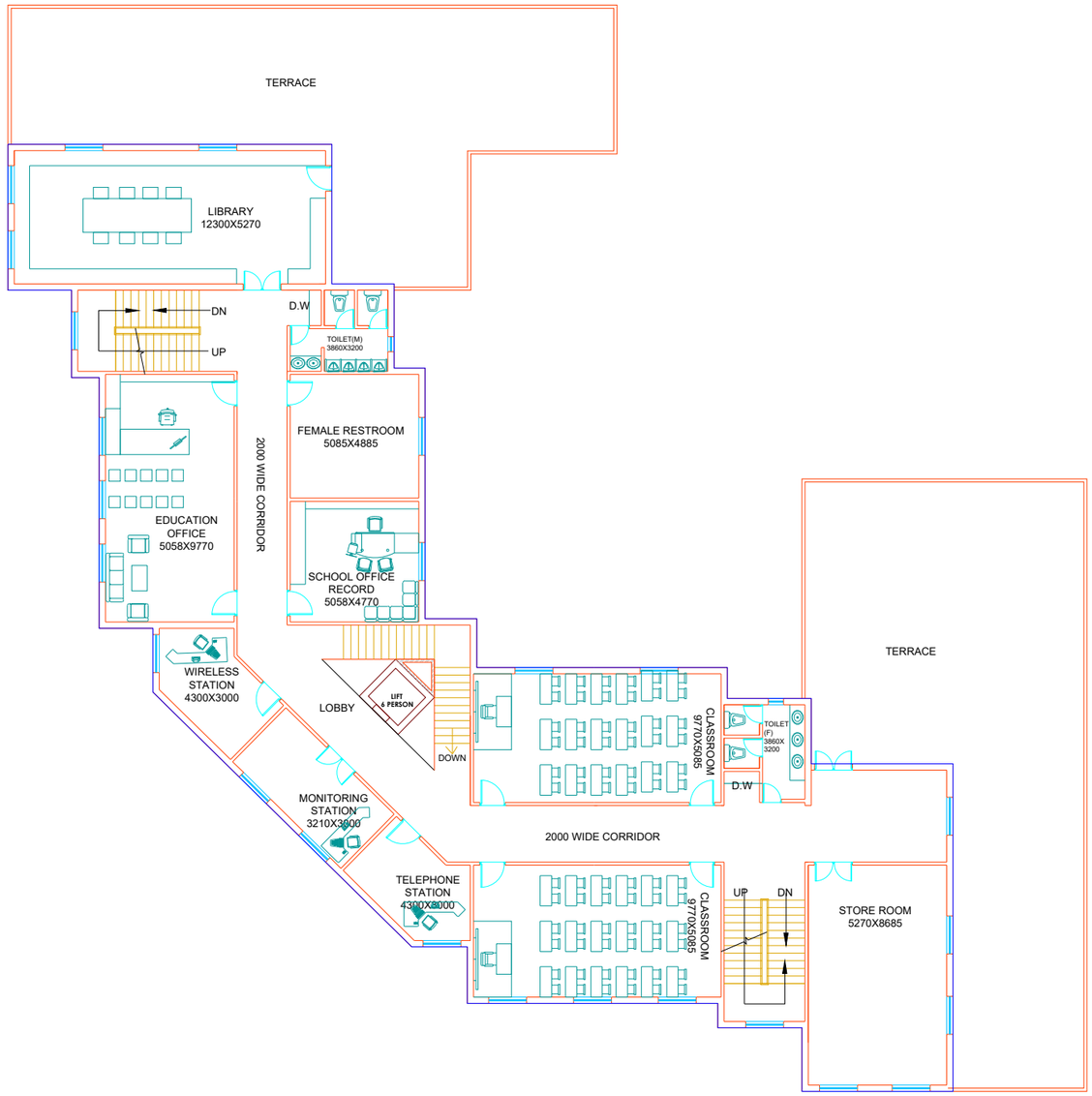
PMC CONSULTANT

WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)

WAPCOS

DATE 18.03.2024	SCALE NTS	TITLE: OFFICE & ADMIN BLOCK FIRST FLOOR PLAN
DEPT: ARCH		
DRN BY:		
CHK BY:		
APP BY:		
JOB NO.		DOCUMENT ID / REV. R0

FOR TENDER PURPOSE ONLY



SECOND FLOOR PLAN

OFFICE CUM ADMIN BLOCK

SECOND FLOOR AREA - 606.2 SQ.M.

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT

PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER

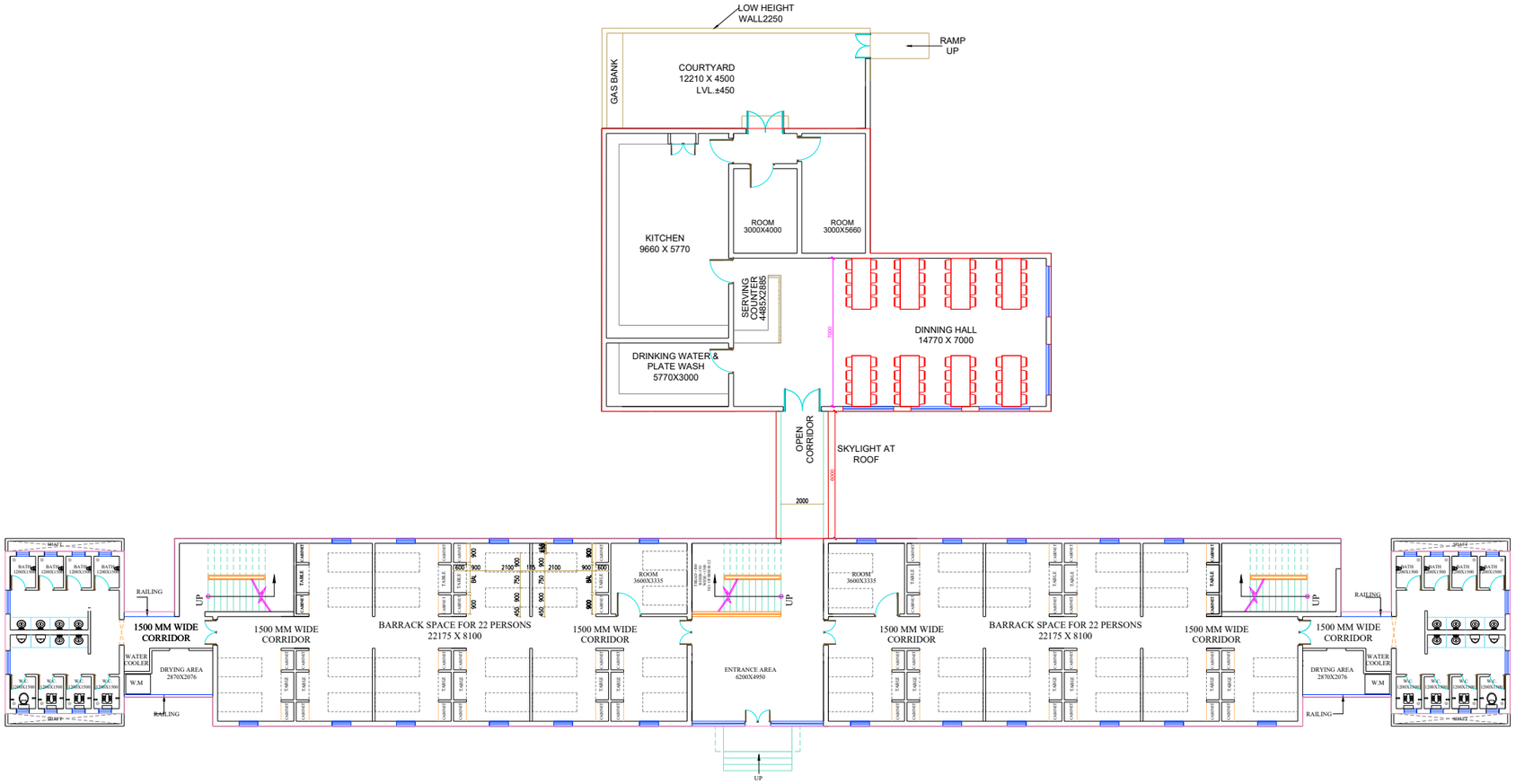
DIRCTORATE GENERAL, SSB (Govt. of India, MHA) East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT

WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)

DATE	SCALE	TITLE:
18.03.2024	NTS	**OFFICE & ADMIN BLOCK**
DEPT:	ARCH	**SECOND FLOOR PLAN**
DRN BY:		
CHK BY:		
APP BY:		
JOB NO.		DOCUMENT ID / REV. R0

FOR TENDER PURPOSE ONLY



GROUND FLOOR PLAN
835.89 Sqm

AREA :
BARRACK AREA : 835.89 SQ.M (G.F.)
BARRACK AREA : 761.44 SQ.M (F.F.)
BARRACK AREA : 631.46 SQ.M (S.F.)

TOTAL AREA OF THE BLOCK: = 2228.79 Sq. M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT वाप्कोस
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

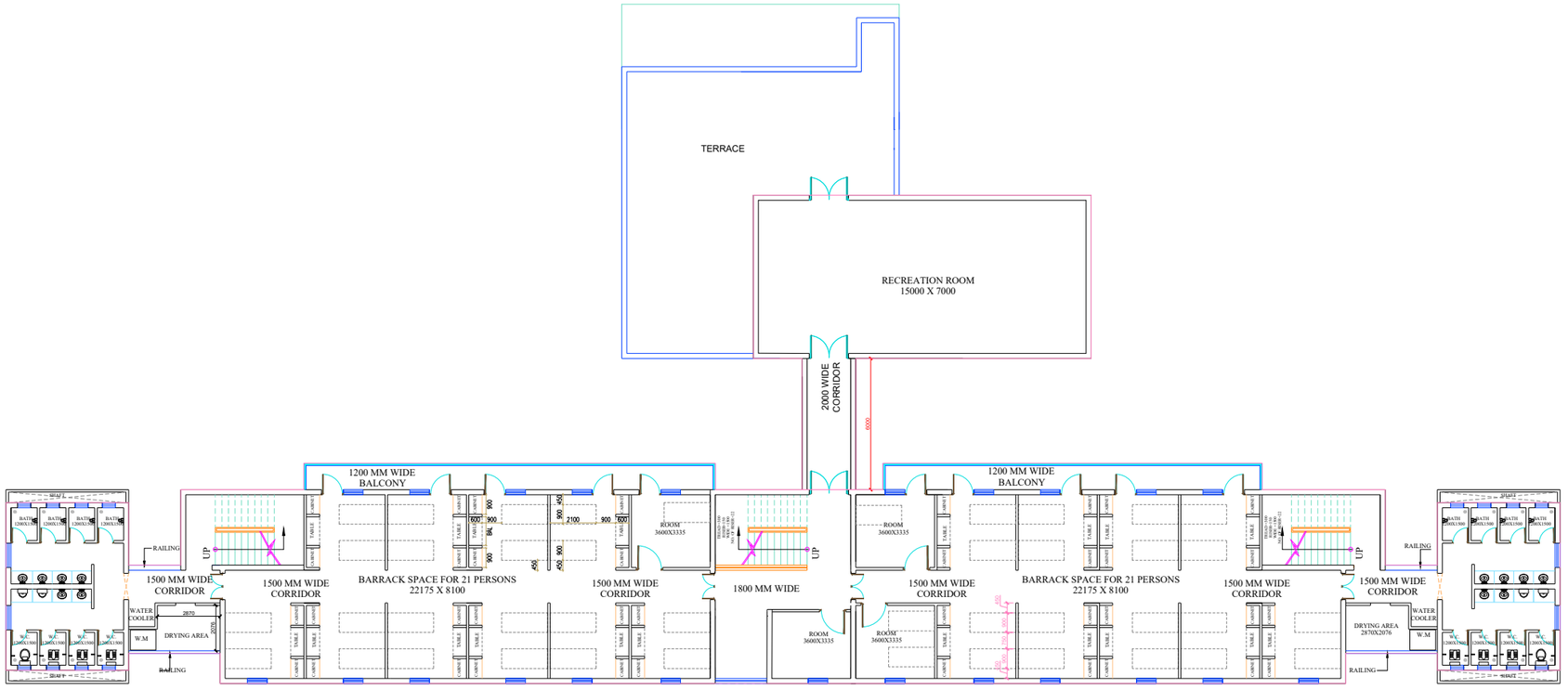
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05.04.2024	NTS
DEPT:	ARCH
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APP BY:	
JOB NO.	

TITLE:
128M- BARRACK
Ground floor plan

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



FIRST FLOOR PLAN
761.44 Sqm

AREA :
BARRACK AREA : 835.89 SQ.M (G.F.)
BARRACK AREA : 761.44 SQ.M (F.F.)
BARRACK AREA : 631.46 SQ.M (S.F.)

TOTAL AREA OF THE BLOCK: = 2228.79 Sq. M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)

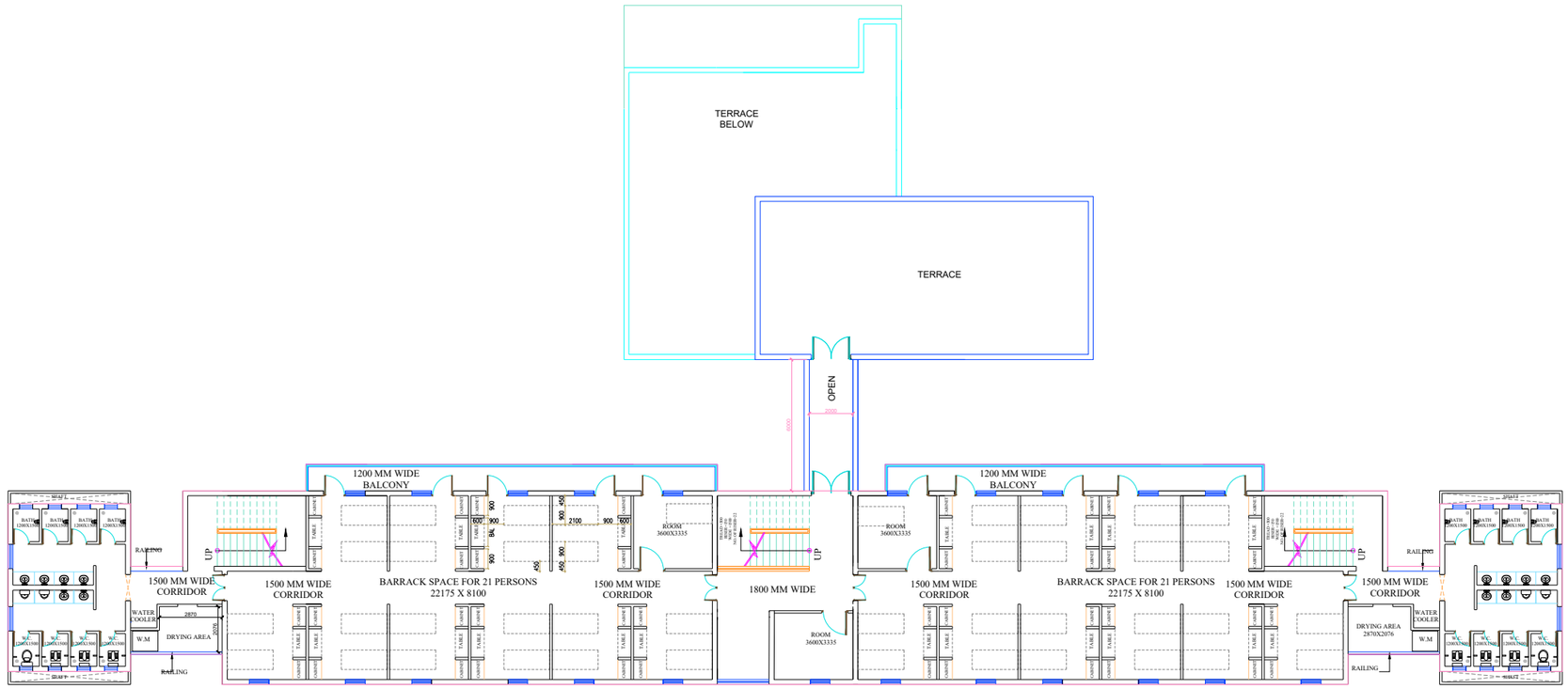
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DRN BY:	
CHK BY:	
APP BY:	
JOB NO.	

TITLE:
128M- BARRACK
First floor plan

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



SECOND FLOOR PLAN
631.46 Sqm

AREA :
BARRACK AREA : 835.89 SQ.M (G.F.)
BARRACK AREA : 761.44 SQ.M (F.F.)
BARRACK AREA : 631.46 SQ.M (S.F.)

TOTAL AREA OF THE BLOCK: = 2228.79 Sq. M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

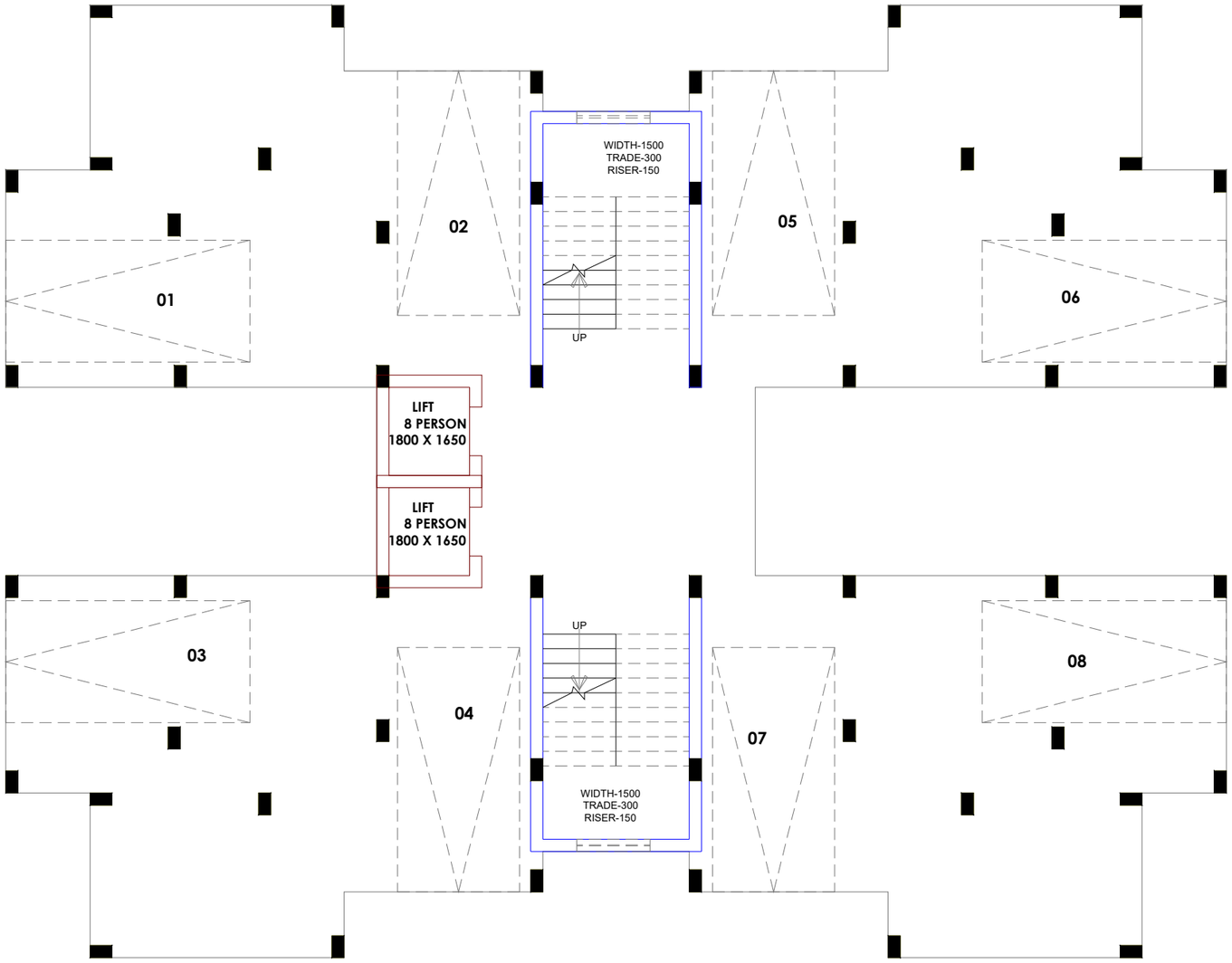
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DEPT:	ARCH
DRN BY:	
CHK BY:	
APP BY:	
JOB NO.	

TITLE:
128M- BARRACK
Second floor plan

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



GROUND FLOOR(STILT) PLAN

TOTAL NO OF **TYP-II QUARTER**
TENEMENT REQUIRED:36 (S+9)
1 TENEMENT AREA: 75 SQ M
(4 TENEMENT PER FLOOR)
TYPICAL FLOOR AREA: 362.6 SQ M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)

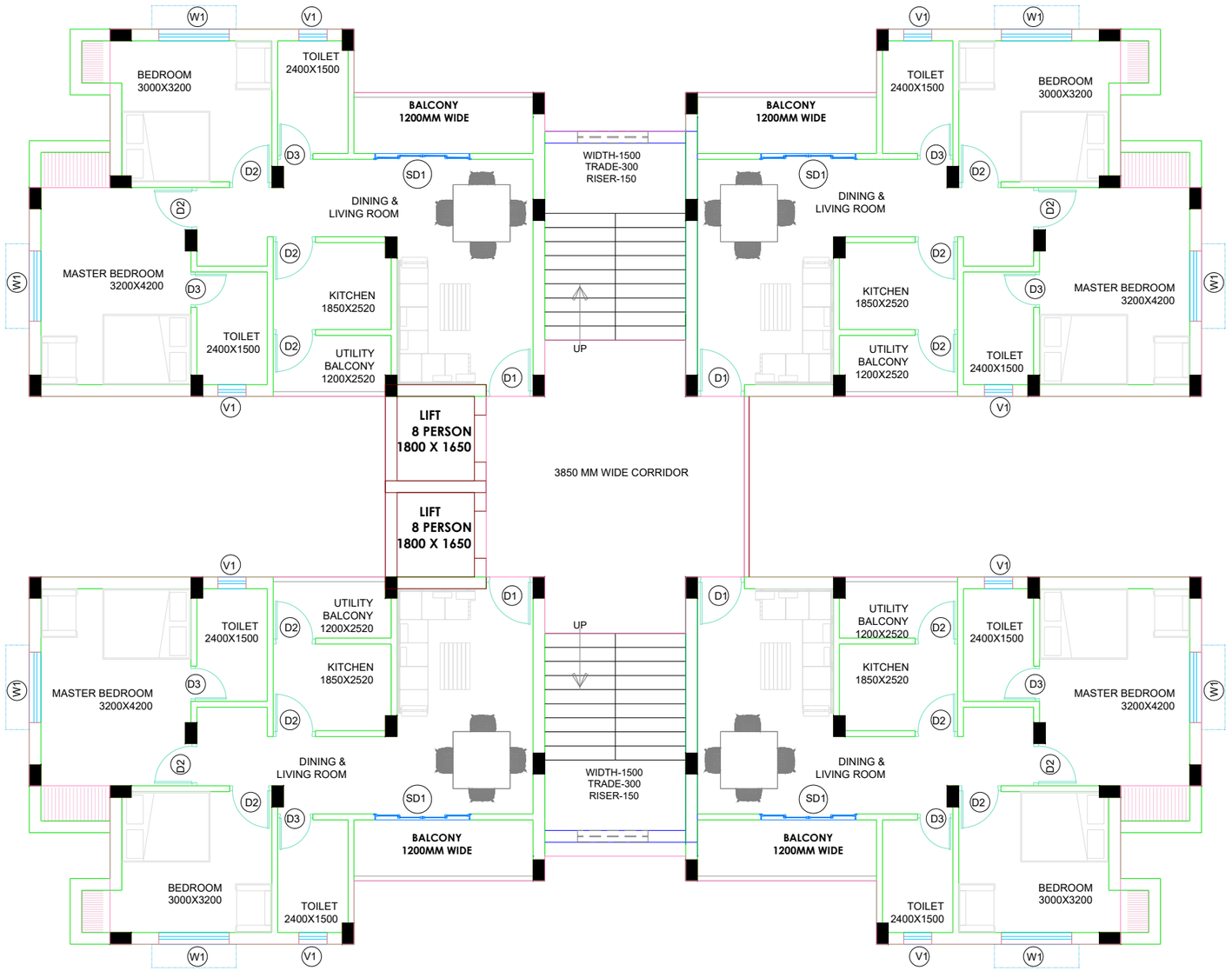
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APP BY:	
JOB NO.	

TITLE:
TYPE II
GROUND FLOOR PLAN

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



TYPICAL FLOOR PLAN

TOTAL NO OF **TYP-II QUARTER**
TENEMENT REQUIRED:36 (S+9)
1 TENEMENT AREA: 75 SQ M
(4 TENEMENT PER FLOOR)
TYPICAL FLOOR AREA: 362.6 SQ M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

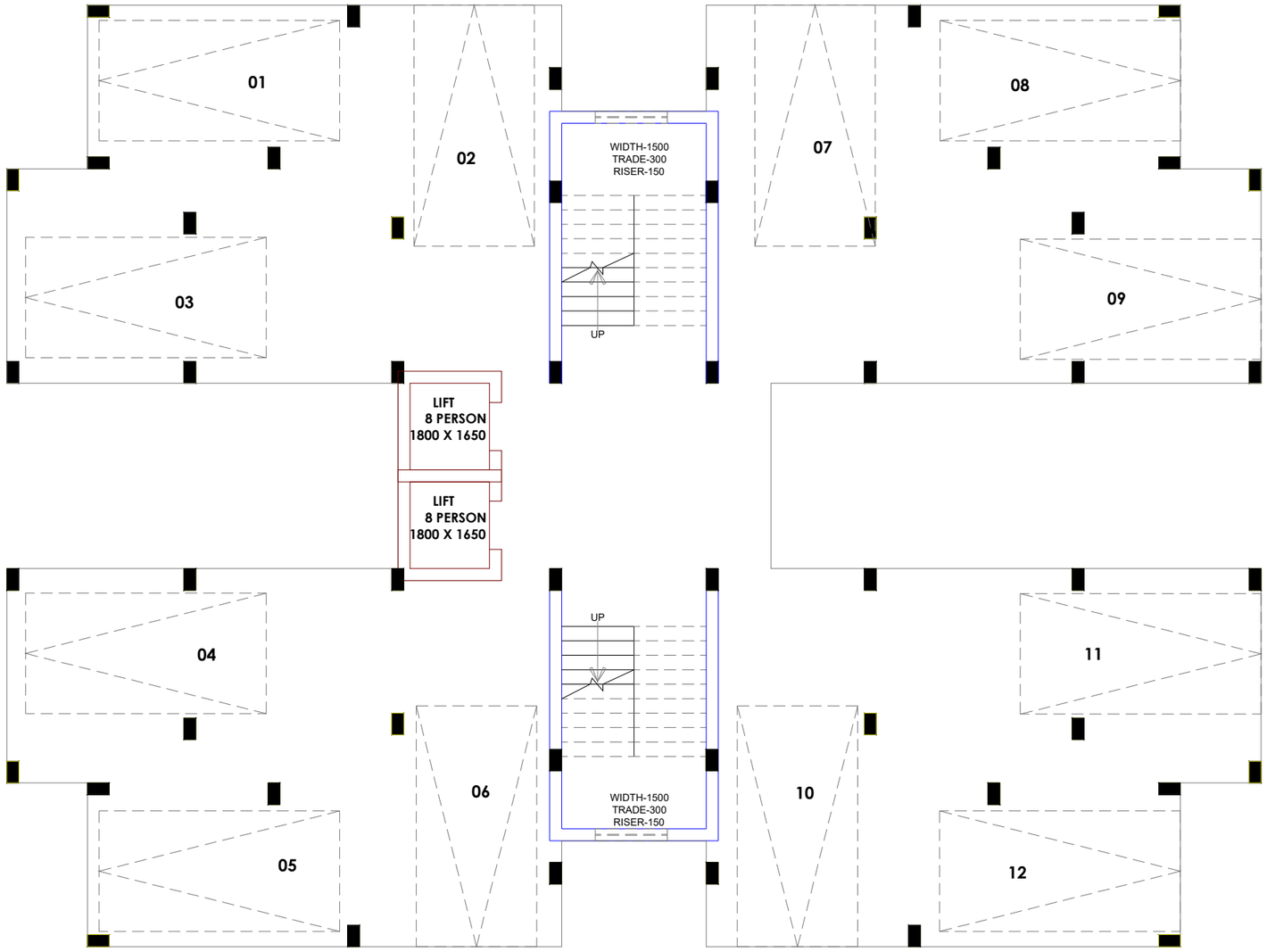
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CHK BY:	
APP BY:	
JOB NO.	

TITLE:
TYPE II
TYPICAL FLOOR PLAN

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



GROUND FLOOR(STILT) PLAN

TOTAL NO OF **TYP-III QUARTER**
TENEMENT REQUIRED:24 (S+6)
1 TENEMENT AREA: 85 SQ M
(4 TENEMENT PER FLOOR)
TYPICAL FLOOR AREA: 403 SQ M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
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OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

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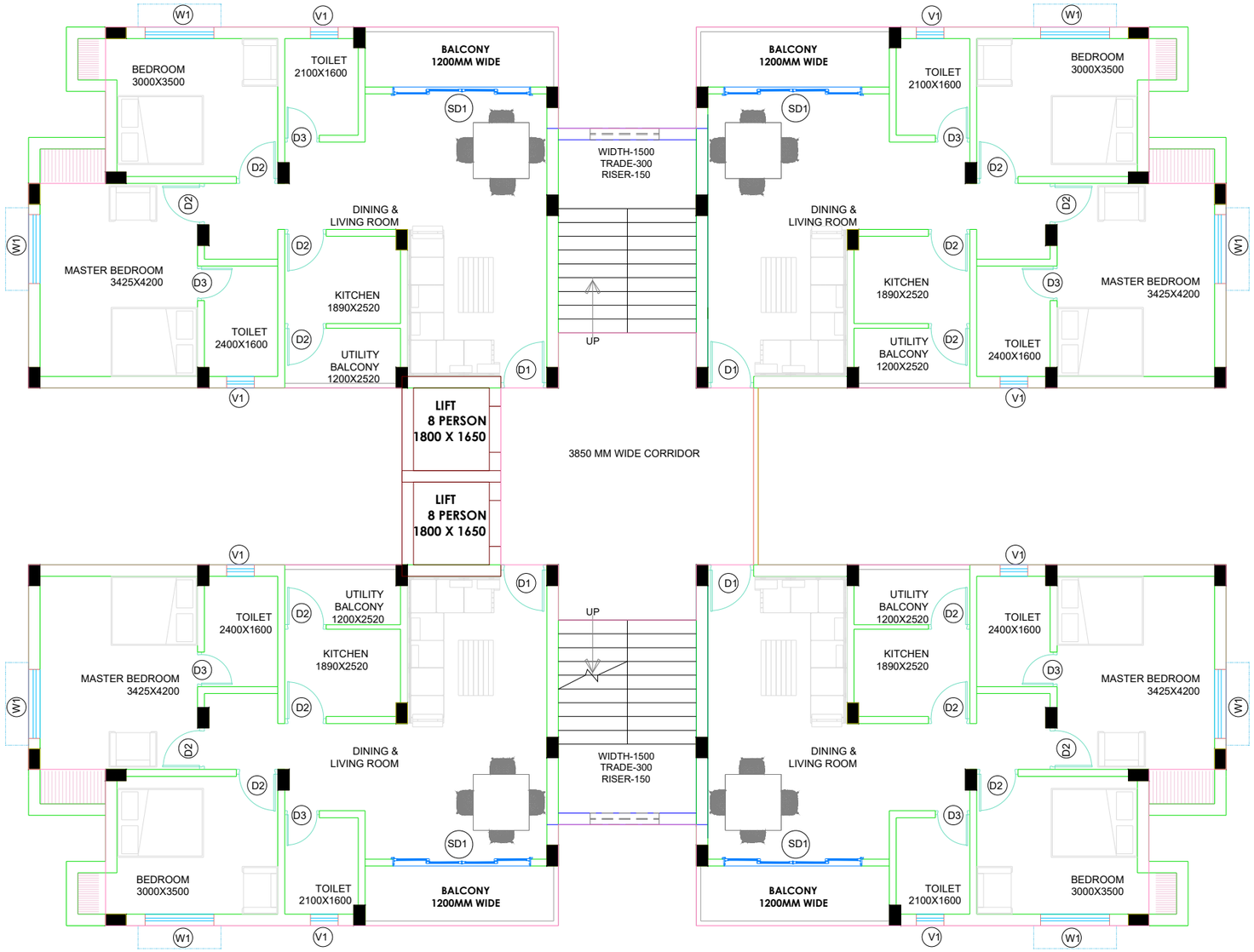
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JOB NO.	

TITLE:
TYPE III
GROUND FLOOR PLAN

DOCUMENT ID

REV. R0

FOR TENDER PURPOSE ONLY



TYPICAL FLOOR PLAN

TOTAL NO OF **TYP-III QUARTER**
TENEMENT REQUIRED:24 (S+6)
1 TENEMENT AREA: 85 SQ M
(4 TENEMENT PER FLOOR)
TYPICAL FLOOR AREA: 403 SQ M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
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OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

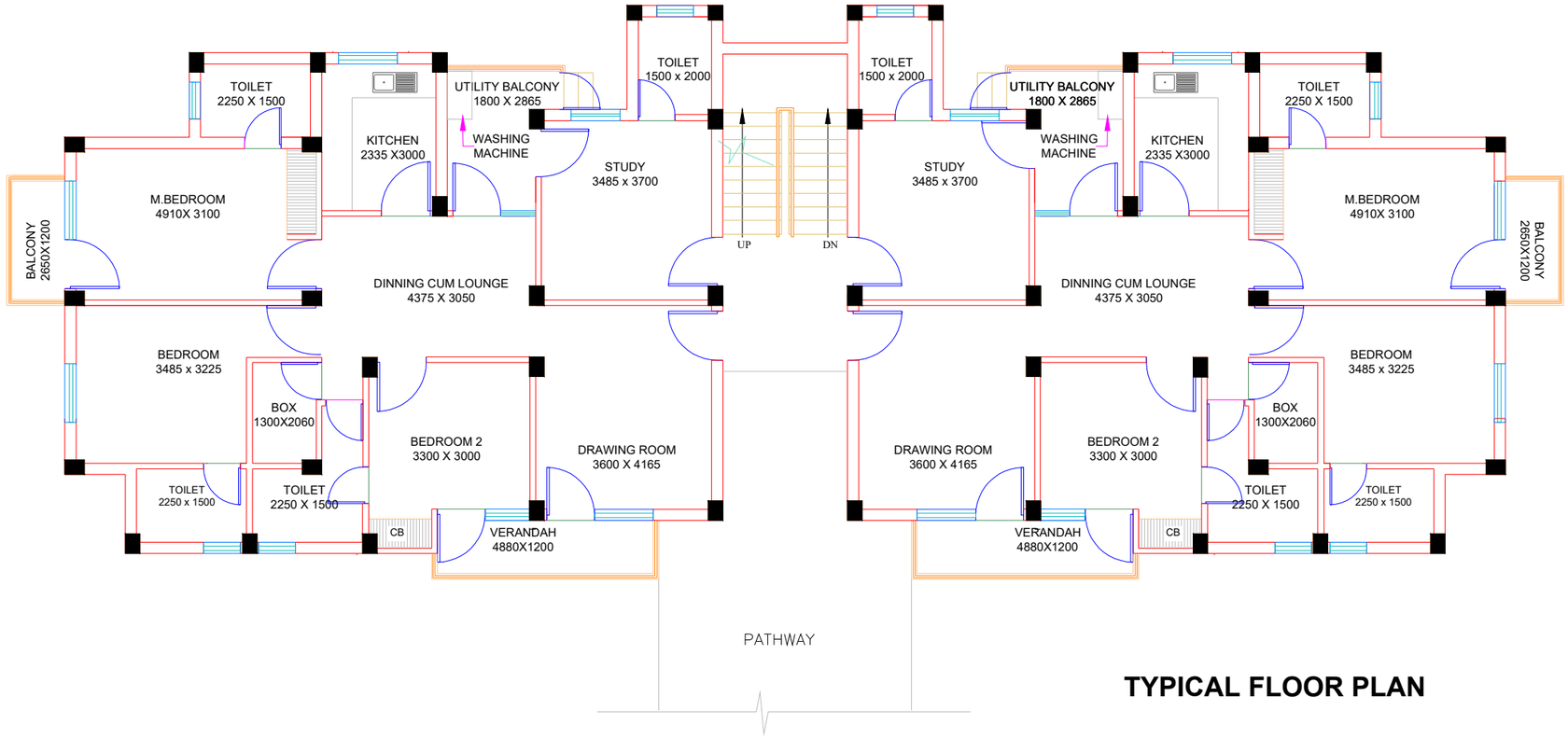
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APP BY:	
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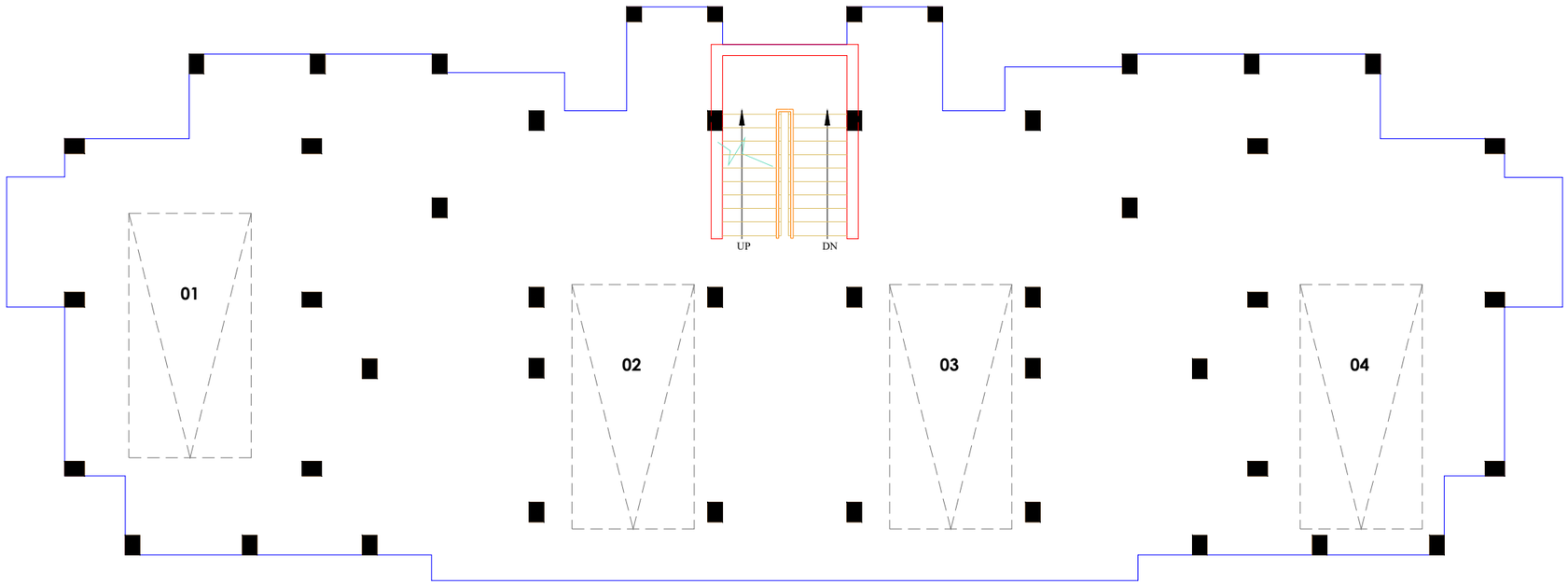
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TYPE III
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DOCUMENT ID
REV. R0

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TYPICAL FLOOR PLAN



GROUND(STILT) FLOOR PLAN

TOTAL NO OF **TYP-IV QUARTER**
TENEMENT REQUIRED:6 (S+3)
1 TENEMENT AREA: 134.6 SQ M
(2 TENEMENT PER FLOOR)
TYPICAL FLOOR AREA: 287.86 SQ M

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

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East Block - V, R.K.Puram, New Delhi- 110066

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WAPCOS

DATE	SCALE
22.03.2024	NTS
DEPT:	ARCH
DRN BY:	
CHK BY:	
APP BY:	
JOB NO.	

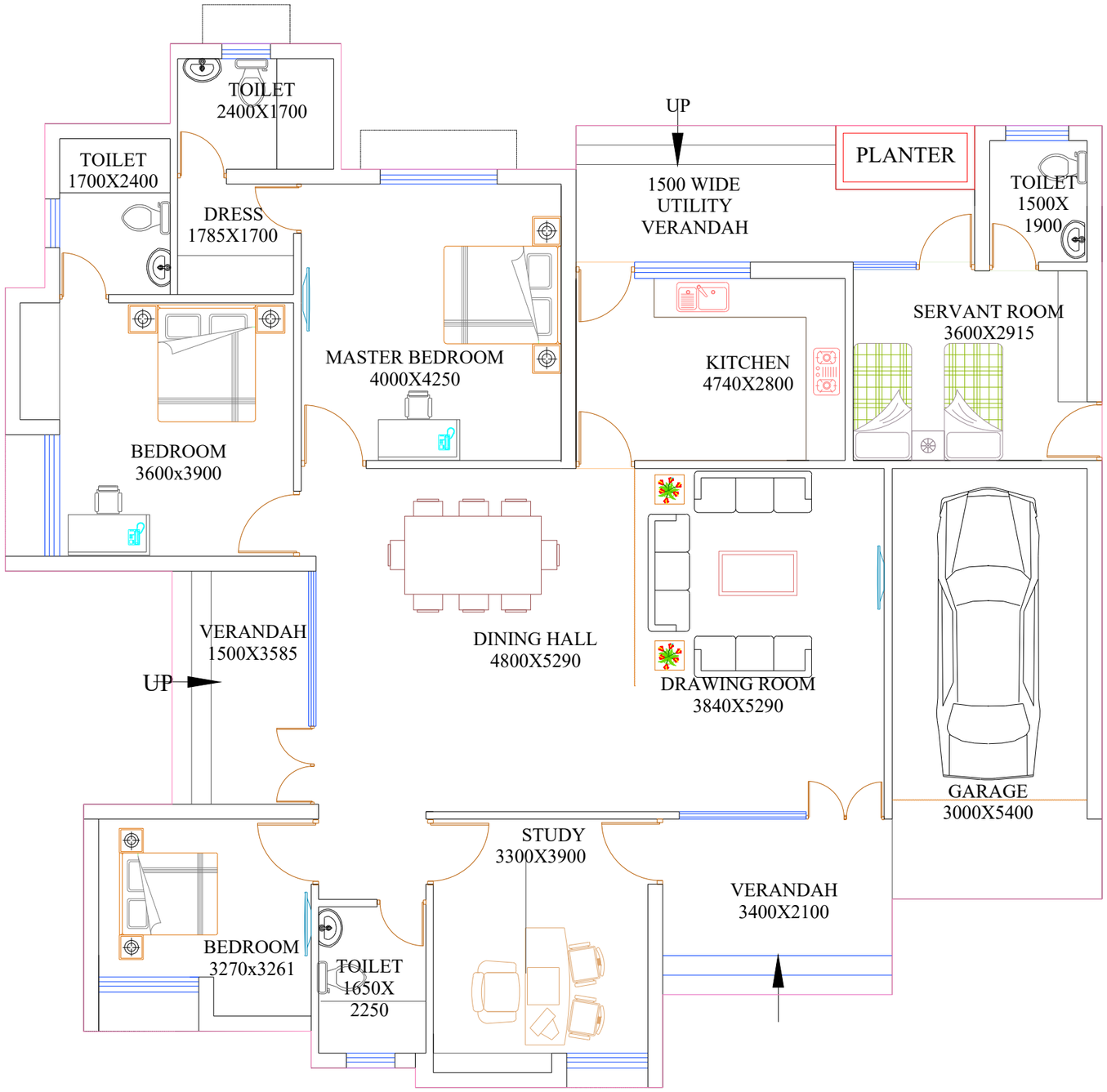
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GROUND & TYPICAL FLOOR PLAN

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TOTAL NO OF **TYP-V QUARTER**
1 TENEMENT AREA: 200.5 SQ M



HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
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OWNER
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East Block - V, R.K.Puram, New Delhi- 110066

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WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
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DATE	SCALE
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TITLE:
TYPE V
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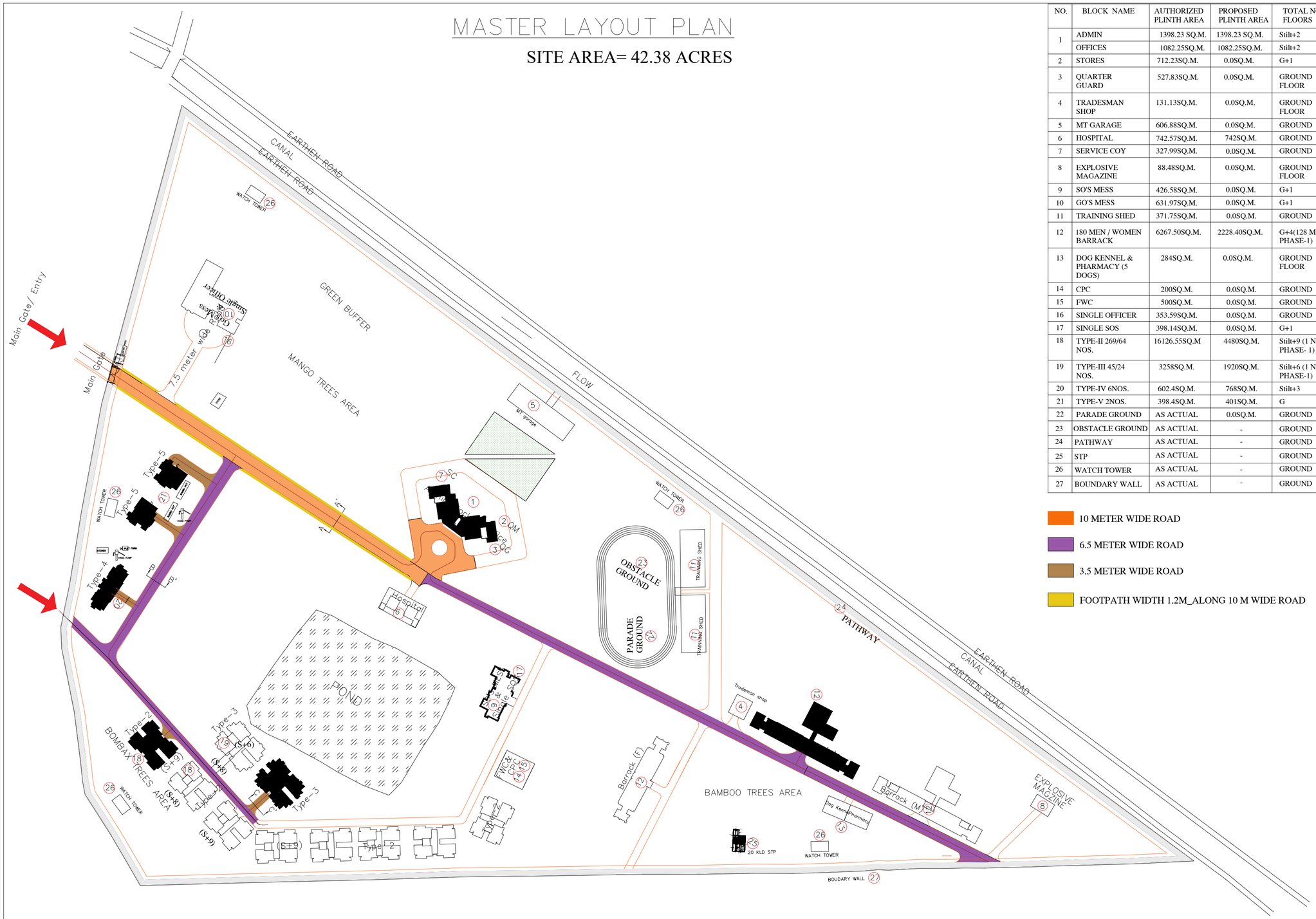
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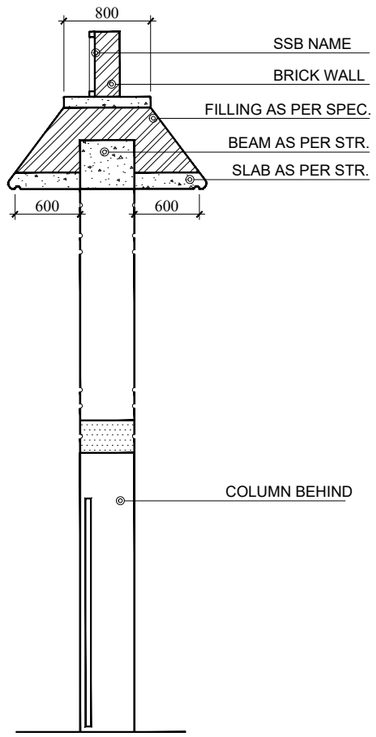
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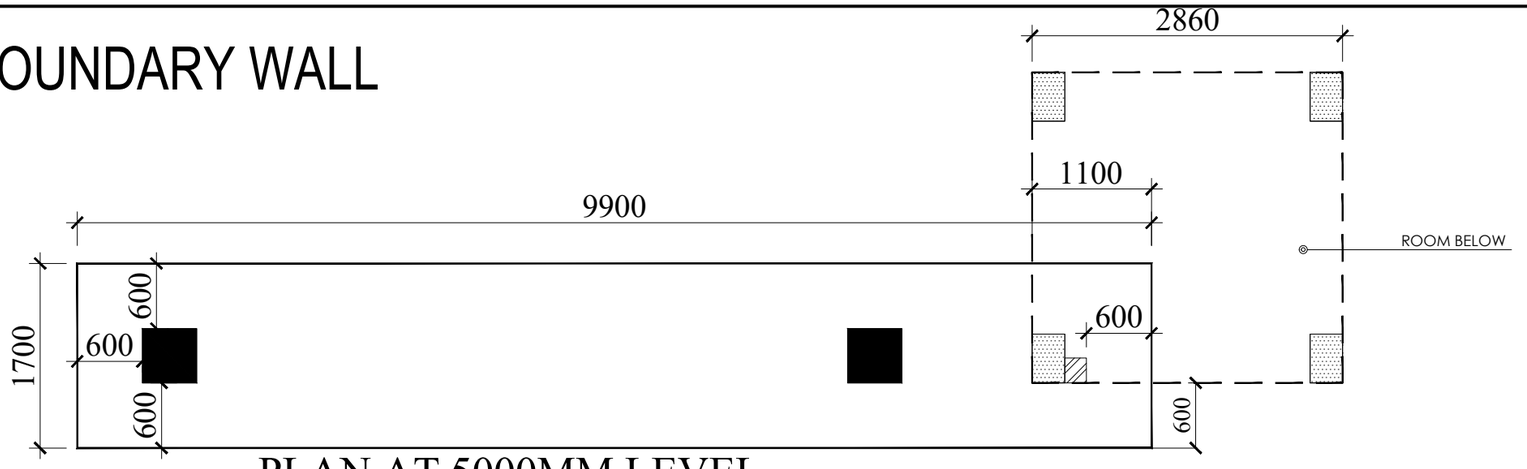
MASTER LAYOUT PLAN

SITE AREA= 42.38 ACRES

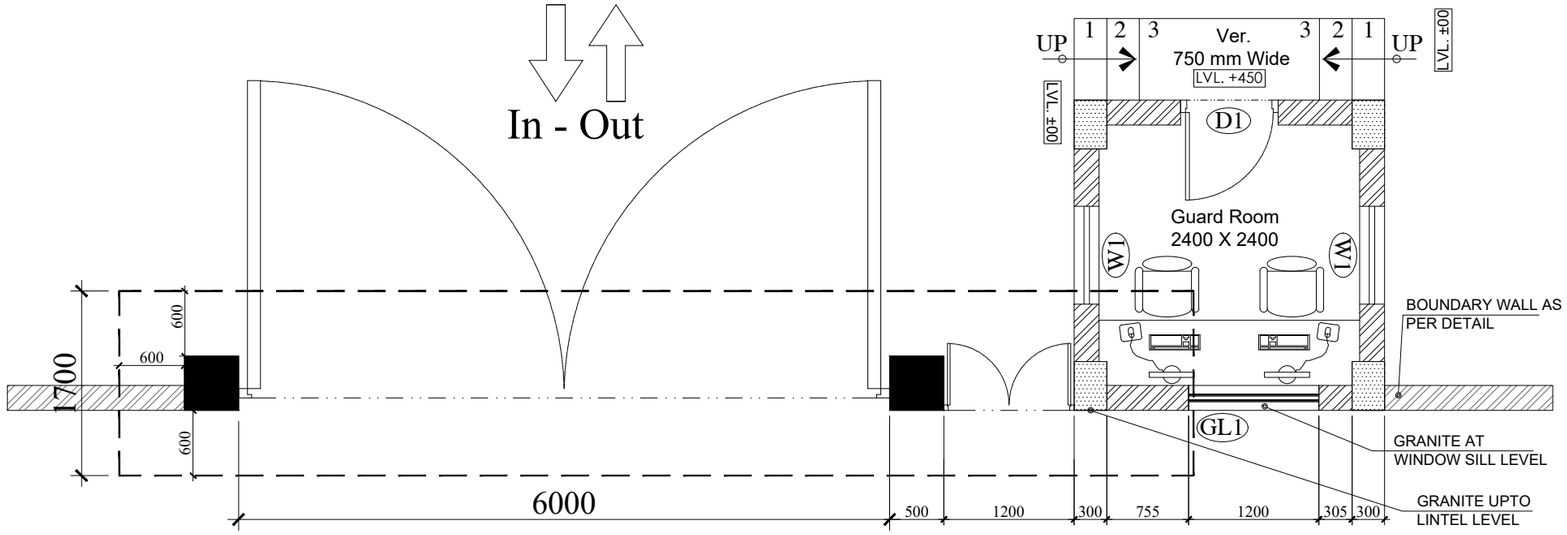

EARTHEN ROAD
CANAL
EARTHEN ROAD
WATCH TOWER
Main Gate/ Entry
Main Gate
Guard Office
Guard Mess
Super Officer
GREEN BUFFER
7.5 meter wide
MANGO TREES AREA
FLOW
UT garage
Type-5
Type-5
Type-4
WATCH TOWER
STORE
Hospital
POND
Type-3
Type-2
Type-3
Type-2
BOMBAY TREES AREA
Type-2
Type-1
Type-2
Type-2
Type-2

GUARD ROOM & BOUNDARY WALL

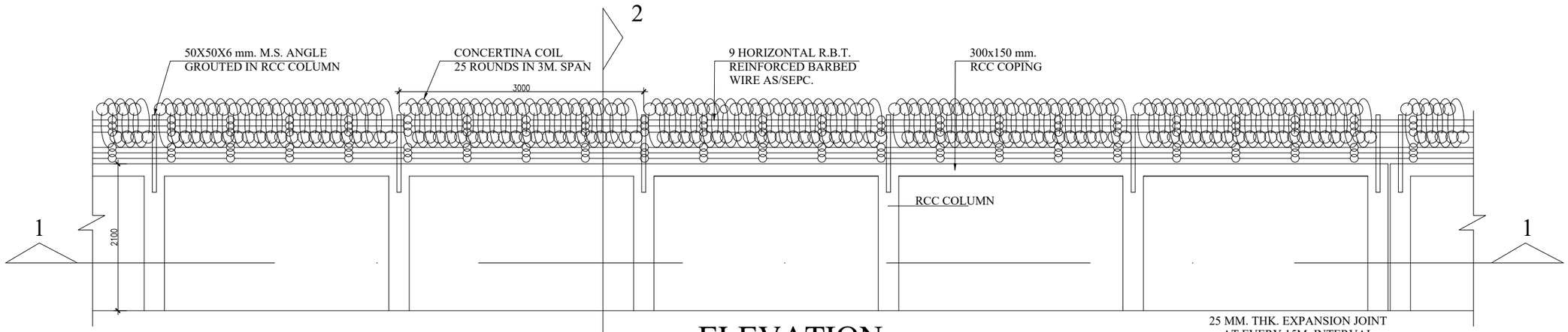




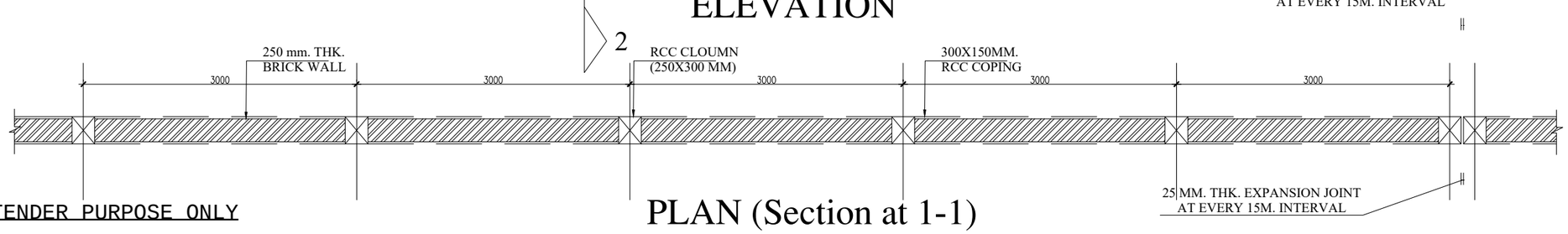
PLAN AT 5000MM LEVEL



Plan At ±00 LVL.



ELEVATION



FOR TENDER PURPOSE ONLY

PLAN (Section at 1-1)

NOTES :

1. DO NOT SCALE THE DRAWING, FOLLOW WRITTEN DIMENSION ONLY.
2. ALL DIMENSIONS IN MM.
3. 750 WIDE PLINTH PROTECTION TO BE PROVIDED ALL AROUND THE BUILDING.
4. SKIRTING SHALL BE 100MM. HIGH FROM FINISHED FLOOR LEVEL.
5. TOILET,PANTRY, KITCHEN VERANDAH & BALCONY FLOOR LEVEL SHALL BE 12 MM. DOWN FROM GENERAL FLOOR LEVEL.
6. ANY DISCREPANCY TO BE CO-ORDINATED WITH ENGG. INCHARGE.
7. ALL MEASUREMENT MUST BE CHECKED AT SITE BY CONTRACTOR.

ARCHITECTURE DRAWING

CLIENT : SASHATRA SEEMA BAL

EXECUTING AGENCY:

WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)

PROJECT TITLE :
CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN. HQRS. SSB ARARIA, BIHAR

DRAWING TITLE :
MAIN GATE, GUARD ROOM & BOUNDARY WALL

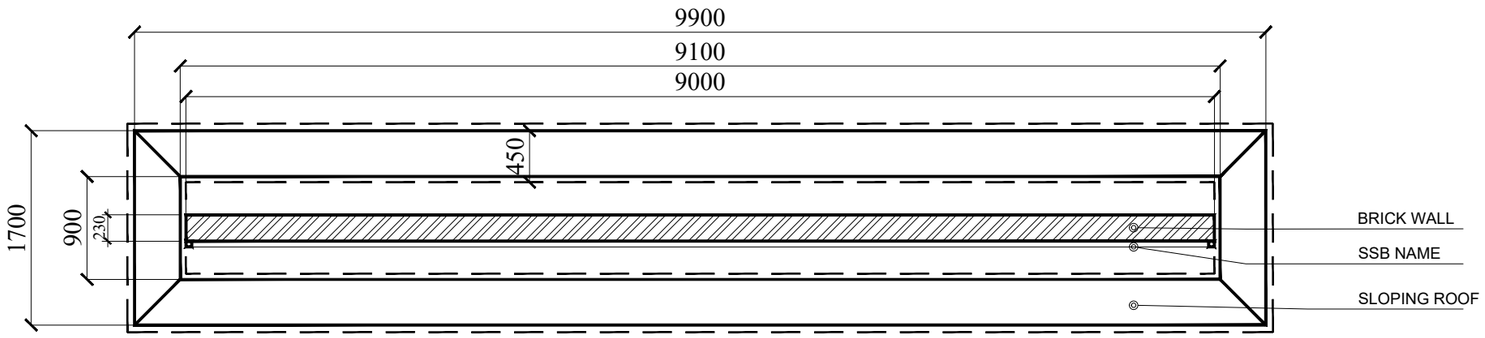
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DATE : 21/11/24	CHECKED BY AR.ROHIT	NORTH :
SCALE : N.T.S		

ARCHITECT:

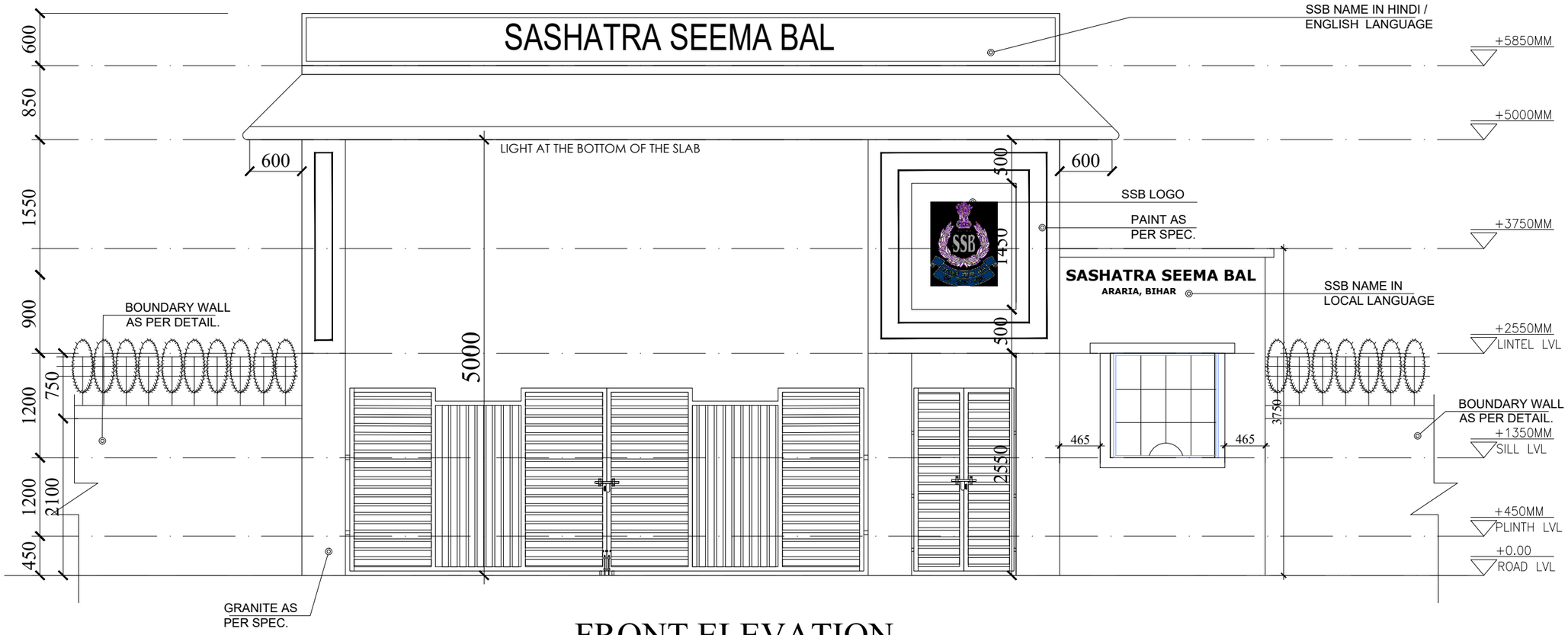
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CELL: 91-8800294486, 8800294471
mriduanjaliarchenggs@gmail.com
www.mriduanjali.com

MAIN GATE



PLAN AT 6400MM LEVEL



FRONT ELEVATION

FOR TENDER PURPOSE ONLY

NOTES :

1. DO NOT SCALE THE DRAWING, FOLLOW WRITTEN DIMENSION ONLY.
2. ALL DIMENSIONS IN MM.
3. 750 WIDE PLINTH PROTECTION TO BE PROVIDED ALL AROUND THE BUILDING.
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ARCHITECTURE DRAWING

CLIENT : SASHATRA SEEMA BAL

EXECUTING AGENCY:

WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

PROJECT TITLE :
CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN. HQRS. SSB ARARIA, BIHAR

DRAWING TITLE :
MAIN GATE, GUARD ROOM & BOUNDARY WALL

SHEET SIZE :	DEALT BY :	DRAWING NO. :
	AR.ANUSHK	AR-01
DATE :	CHECKED BY	NORTH :
21/11/24	AR.ROHIT	
SCALE :		
N.T.S		

ARCHITECT:

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REPORT ON
GEOTECHNICAL INVESTIGATION FOR CONST. OF INFRASTRUTURE AT SASHASTRA SEEMA BAL (S.S.B.) BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.

FOR

CHIEF ENGINEER,
CONSTRUCTION MANAGEMENT UNIT-III,
WAPCOS LTD.
NPCC BUILDING, PLOT NO.-148, SECTOR-44,
GURUGRAM, HARYANA-122003.

MAY- 2024

PREPARED AND SUBMITTED BY

ALLIED ENGINEER'S
FLAT NO.54-A, ED-BLOCK, PITAMPURA,
DELHI-110034
PH-(O) +918588963664, (M) 09350104466,
EMAIL:-alliedengineers77@gmail.com

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CHAPTER:- 1

INTRODUCTION

1.1 GENERAL

Chief Engineer, **Construction Management Unit-III, WAPCOS Ltd.,** has proposed to construct infrastructure at S.S.B. Battalion Head Quarters (Bn. H.Q.) at Araria, Bihar. To design an efficient and economic foundation of the structure, the knowledge of general Geotechnical characteristics, subsoil strata, its characteristics strength, compressibility and information about ground water table is an essential requirement.

Keeping above in view, **Chief Engineer**, **Construction Management Unit-III, WAPCOS Ltd.,** has proposed to conduct a detailed geotechnical investigation of the project site and entrusted the work of soil investigation to M/**S ALLIED ENGINEERS, Flat No. 54-A, ED- Block, Pitampura- Delhi 110034.**

The report presents the analysis of test results and recommendation regarding type of foundation and safe bearing capacity. The observed data of field investigation and laboratory tests are presented and uses to access the nature of sub soil strata and to evaluate the soil parameter required for the design of foundation for different structure.

1.2 SITE & STRUCTURE :-

The site of the proposed structure is located at Araria in the district of Bihar. The proposed SSB head quarters complex contains various structures such as Admin block, offices, store rooms, quarter guard, service coy, Tradesman shop, 180 men and women barrack, MT garage, hospital building, dog kennel & pharmacy, explosive magazine, SO'S. Mess, single SOS, GO'S Mess, single officers room, training shed, CPC, FWC, residential quarter's type-II to type-V, parade & obstacle ground, pathway, STP, watch tower & boundary wall etc at the project site. The proposed buildings consist of stilt/ground floor with one to six and nine additional storey structures without basement. The general ground of the proposed locations is almost plane & dressed up.

AEs

CHAPTER 2

SCOPE OF WORK:-

The detailed scope of work of geotechnical investigation for the project was limited to the following.

Mobilization of equipment and personnel to the project site, setting up the equipment and carrying out the field investigation and demobilization of the same after completion of field activities.

Drilling 6.0 Nos. of 100–150 mm diameter bore holes using shell and auger up to the depth of 15.0 m or up to refusal whichever occurs earlier.

Conducting standard penetration test at regular intervals or at the change of strata which ever is earlier and also collection of each SPT sample for laboratory test.

Collection of the disturbed and undisturbed soil sample at suitable interval or at the change of the strata whichever is earlier.

Recording the ground water table in the bore hole (if observed).

Collection of water & soil samples from the bore holes for the aggressive chemical contents. Perfuming 2.0 nos. tests of chemical examination on water sample for pH, Sulphate, chloride & termites.

Performing 3.0 nos. chemical test on soil samples for sulphate, carbonates, chloride, nitrate, magnesium, calcium, sodium & potassium

Performing chemical test on water sample for drinking purpose as per relevant IS specifications.

.

Conducting all necessary and relevant laboratory tests on selected soil sample limited to following.

a) Sieve Analysis

b) Liquid and Plastic Limit

c) Natural Moisture Content

d) Bulk and Dry Density

e) Specific Gravity

f) Void Ratio

g) Unconsolidated Un-drained Tri-axial Shear Tests

h) Direct Shear Test

i) Consolidation Test

Analysis of test result and submission of report giving all the test data along with soil profile and recommendation regarding type and the depth of foundations for the proposed structure and suggested net safe/ allowable bearing capacities.

CHAPTER 3.0
FIELD INVESTIGATION:-

The testing equipment and personnel for carrying out the requisite field work were mobilized to the site. These were shifted from one test location to another location during the course of field work and demobilized on satisfactory completion of the entire field work.

Location & RL of bore holes were provided at the site by the concerned Engineer in charge of the project site.

In all 6.0 Nos. of test bore holes of 100-150 mm diameter were drilled at the site of proposed structure using shell & auger Methods in accordance to IS: 1892 –1976. Casing as required was used to retain the bore hole. The test bore holes were terminated at the depth of 15.0 m below existing ground level as per scope of work.

Standard penetration test were conducted in the bore hole at regular / desired intervals as per IS: 2131 – 1981. The bore was cleaned up to the desired depth. Standard split spoon sampler attached to lower end of 'A' size drill rods was driven in the bore hole by means of standard hammer of 63.5 Kg. Falling freely from a height of 75 cm. The sampler was driven 45 cm and the number of blows required for the first 15 cm. penetration were not taken in to account. This was considered as seating drive. The number of blows for last 30 cm penetration were designated as SPT 'N' value.

Soil samples obtained from standard split spoon sampler for all above standard penetration tests were collected in the polythene bags of suitable size. These samples were properly sealed, labeled, recorded and carefully transported to the laboratory for testing.

Undisturbed soil samples were also collected from the bore holes at regular intervals as per IS: 2131 – 1986 in thin walled sampling tubes of 100 mm diameter and 450mm length. These sampling tubes after retrieval from the bore holes were properly waxed and sealed at both ends. These were carefully labeled and transported to the laboratory for testing.

Two nos. water sample each (i.e. for drinking purpose & chemical test)along with three nos. soil samples from the bore holes has been collected and properly sealed sample sent to testing laboratory for chemical examination as per relevant IS specification.

The ground water table in the boreholes is generally measured after 24 hours of the boring after stabilization. However the sub soil water at the project site was observed at **3.15 m to 3.25 m** depth below existing G.L. in the various bore holes in the month of **April-2024**. ***The proposed project site is located at Approx. 19.6 KM away from Parmaan River. The Parmaan River originates from hilly areas of Nepal and enters in Indian Territory at Araria District, Bihar. As per local enquiry, it was reported that the observed water table may further rise up to/or above the existing ground level during flood in River Parmaan or in rainy season during heavy to very heavy rains in monsoon season***.

.

Disclaimer:-sometimes the measured sub soil water table may rise abnormally depending upon heavy to very heavy rainfall or due to local recharge schemes such as Rain water harvesting or any other scheme in the particular area. The abnormal rise in water table will have impact on the recommended bearing capacity hence this point must be intimated to us if observed during actual construction activity. It is also suggested to re-verify the sub soil water level before start of construction activity.

CHAPTER 4
LABORATORY TESTS:-

The following laboratory tests were conducted on selected soil sample recovered from the bore hole location:-

a) Sieve Analysis

b) Liquid and Plastic Limit

c) Natural Moisture Content

d) Bulk and Dry Density

e) Specific Gravity of Soil

f) Void Ratio

g) Unconsolidated Un-drained Tri-axial Shear Test.

h) Direct Shear Test

i) Consolidation Test

The above laboratory test were carried out as per relevant Indian standard code of practice. The result of laboratory tests are shown in bore log sheet 1 to 6. All the soil sample were identified and classified a per IS: 1498 – 1970. **Direct shear tests on few samples were conducted under consolidated un-drained/drained test condition. The pressure applied on these samples initially was 0.6 Kg/cm^2 to minimize sample loosening during extruding.** Many sandy samples were slipped during drilling hence the shear tests are performed on the remoulded as well as original sample depending upon the extraction from the UDS tube procured.

CHAPTER 5
TEST RESULTS AND INTERPRETATIONS

5.1 SOIL PROFILE

The bore-logs of bore hole given in bore log sheet 1 to 6 as shown in Annexure 'A' A thorough perusal of the bore hole reveals that:

a) The site of the proposed structure is located at Araria in the district of Bihar. The proposed SSB head quarters complex contains various structures such as Admin block, offices, store rooms, quarter guard, service coy, Tradesman shop, 180 men and women barrack, MT garage, hospital building, dog kennel & pharmacy, explosive magazine, SO'S. Mess, single SOS, GO'S Mess, single officers room, training shed, CPC, FWC, residential quarter's type-II to type-V, parade & obstacle ground, pathway, STP, watch tower & boundary wall etc at the project site. The proposed buildings consist of stilt/ground floor with one to six and nine additional storey structures without basement. The general ground of the proposed locations is almost plane & dressed up.

b) The sub soil strata in BH-1 to BH-6 mainly consists of light grayish/blackish colour poorly graded medium to fine silty sandy soil of non plasticity (classified as SP-SM) from existing GL to 15.0 m depth below EGL at the various bore hole locations.

c) The sub soil water table at this site was observed a**t 3.15 m to 3.25 m** depth below existing G.L. in pre monsoon season at various bore hole locations in the month of **April-2024**. This ground water table may further rise up to/or above the existing ground surface during flood in nearby River Parmaan or in rainy season during heavy to very heavy rains in monsoon season.

d) The observed field SPT 'N' values at this site varies from 6 to 32 within 15.0 m depth. The sub soil layers shows very loose to medium dense nature of strata in entire depth of drill holes.

e) No voids, organic matter etc. have been observed from the sample collected during drilling operation in the sub soil.

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f) The particle size gradation curve shows poorly graded sub soil strata (i.e. fine sandy soil) up to 15.0 m depth below EGL.

The uniformity coefficient **(Cu=D60/D10)=3.2203 to 4.1667** and coefficient of curvatures **($Cc=(D_{30})^2/(D_{60}XD_{10})$=0.88167 to 2.0071** of sub soil within 15.0 m depth are within range of well graded as per IS 1498-1970. The grain size analysis shows clay fractions varying from Nil (i.e. 0%), silt sizes vary from 14.95 % to 17.20 %, fine sand vary from 63.0 % 78.10 % and mediam sand sizes vary from 4.20% to 20.65% respectively at various depths in the bore holes.

g) As per the seismic zonation map, the proposed site at Araria District, Bihar is situated in seismic zone V. The liquefaction analysis based on co-relations presented in IS 1893 (Part-I):2016 clause 3.12 and 6.3.5.3 (Annexure F) on the basis of SPT values shows ***that the sub soil strata is liquefiable within 13.5 m to 15.0 m depth below EGL in BH-1 to BH-5***. **The liquefaction analysis is carried out for earthquake Moment Magnitude of 7.5, max/peak ground acceleration of 0.36g and sub soil water table at 3.15 m to 3.25 m depth below EGL. The** factor of safety of liquefaction resistances of the sub soil strata against shear stress induced due to **earthquake in Seismic Zone V** is less than unity within 13.50 m to 15.0 m depth.

h) In view of nature of proposed multistoried building (i.e. stilt/ground floor with one to six and nine additional storey without basement) and sub soil parameter obtained from the boreholes along with liquefiable strata up to 15.0 m depth in BH-1 to BH-6, the safe bearing pressure values for shallow footing (i.e. isolated square footing & raft foundation) & bored cast in situ pile foundation is analyzed but the bored cast in situ pile is recommended for execution at the project site.

5.2 TYPE AND DEPTH OF FOUNDATION:-

Based on the results of field investigation, laboratory test result and details of proposed structures (i.e. buildings having stilt/ground floor with one to six and nine additional storey without basement), the allowable bearing capacity is calculated for shallow footing (i.e. Isolated square footing & raft foundation) along with bored cast in situ pile foundation and presented below.

5.3 ANALYSIS OF BEARING CAPACITY:-

The safe bearing capacity of the sub soil strata for the foundation are being computed generally in accordance to IS:- 6403 - 1918, IS 8009(part – I) - 1997 and IS: 1904 – 1962 using shear failure criteria and permissible settlement consideration based on the engineering properties and strength characteristics of weakest soil layer at around at around in the influence zone of foundation.

The net allowable bearing capacity shall be lower of above two consideration i.e. shear failure criteria and permissible settlement consideration. Based on the soil parameters as shown above, the allowable bearing capacity shall be as per following.

DESIGN SOIL PARAMETER:-

For the computation of bearing capacity using both shear failure criteria and settlement consideration, the soil parameter were taken based on the engineering characteristic of weakest soil layer within the influence zone of foundation. For the site under consideration, the following parameter may be selected.

Corrected design SPT ‘N’ values are given in bore log sheet 1 to 6. The average of the lowest values has been taken for design purpose.

SHEAR FAILURE CRITERIA:-

The value of net safe bearing capacity of sub soil strata has been estimated by considering local shear failure for foundation laid at the different depth using the following equation for the net ultimate bearing capacity.

qu = 2/3 CNc'Scdci$_c$ + q (N'q-1)Sqdqiq + 0.5 Y BNy' SydyiyW'

The factor of safety has been considered as 2.5. The following parameters were selected to use in above equation.

PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.						
SUB SOIL PARAMETER ,						
Cohesion	0.00	Angle of Internal Friction Φ	28.50	Angle of Internal Friction for Local shear Φ '	19.90	
Nc'	14.78	Nq'	6.35	Ny'	5.33	**Local shear**

q = Overburden pressure = y *d

shape factors ; Sc = 1.3, Sq =1.2 Sy =0.8 (Isolated square)

Sc = Sq = Sy =1.0 (For continuous strip footing)

Sc = Sq = 1+0.2*B/L, Sy = 1– 0.4 * B/L (For rectangular footing)

Depth factors ; dc = dq = dy = 1.0

Inclination Factors; ic = iq = iy= 1.0

In view of sub soil water table at **3.15 m to 3.25 m depth** in pre monsoon season, the sub soil water correction factor 'W' has been taken as=0.50 for shallow footing (i.e. isolated square footing & raft foundation) in all the calculation of bearing /load carrying capacity considering worst condition during life time of the building.

Based on above parameter, safe bearing capacity is computed for (i.e. isolated square footing & raft foundation) laid at the depth of 1.5 m to 2.0 m depth below existing G.L. with sizes ranging 1.0 m to 3.0 m for shallow footing and 10.0 m to 30.0 m for raft foundation.

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PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			
SAFE BEARING CAPACITY AS PER SHEAR CONSIDERATION (LOCAL SHEAR)			
DEPTH OF FOOTING Below EGL(m)	**WIDTH OF FOOTING (m)**	**LENGTH OF FOOTING (m)**	**NET SAFE BEARING CAPACITY (LOCAL SHEAR)(T/M2)**
			ISOLATED SQUARE FOOTING
1.50	1.00	1.00	10.23
1.50	2.00	2.00	11.35
1.50	3.00	3.00	12.48
2.00	1.00	1.00	13.27
2.00	2.00	2.00	14.39
2.00	3.00	3.00	15.51
			RAFT FOUNDATION
1.50	10.00	20.00	12.86
1.50	20.00	40.00	19.89
1.50	30.00	60.00	26.92
2.00	10.00	20.00	14.80
2.00	20.00	40.00	21.83
2.00	30.00	60.00	28.86

SETTLEMENT CONSIDERATION:-

The settlement of cohesion less layers in the zone of influence were computed using SPT 'N' values in accordance to clause 9.1.4 of IS: 8009 (Part - 1) 1976 and figure 9 of IS code with suitable correction factor for water table. Settlement of cohesive layer in the influence zone were computed as per clause 9.2 for normally consolidated clay layer with suitable correction factor for pare pressure parameter. Depth factor and rigidity factor has been considered for raft foundation as per fig. 12 of IS code. The zone of influence below the foundation depth for footing was generally considered equivalent to one and half times of 'B' where B is width of footing.

The total permissible settlement for the shallow footing (i.e. isolated square footing & raft foundation) has been considered as **50 mm and 75 mm respectively**. The values of net bearing pressure were computed using the average SPT 'N' value within the influence zone, the influence zone were taken as 1.5 times the 'B' where 'B' is width of the footing.

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PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			
ALLOWABLE BEARING CAPACITY AS PER SETTLEMENT CONSIDERATION			
DEPTH OF FOOTING Below EGL(m)	**WIDTH OF FOOTING (m)**	**LENGTH OF FOOTING (m)**	**NET ALLOWABLE BEARING CAPACITY (T/M2)**
			ISOLATED SQUARE FOOTING
1.50	1.00	1.00	8.00
1.50	2.00	2.00	7.60
1.50	3.00	3.00	7.35
2.00	1.00	1.00	8.50
2.00	2.00	2.00	8.10
2.00	3.00	3.00	7.80
			RAFT FOUNDATION
1.50	10.00	20.00	16.35
1.50	20.00	40.00	15.65
1.50	30.00	60.00	15.40
2.00	10.00	20.00	18.00
2.00	20.00	40.00	17.60
2.00	30.00	60.00	17.35

AEs

CHAPTER-6
RECOMMENDATION

Based on field investigation, laboratory test results, sub soil parameter observed and proposed structures (i.e. buildings having stilt/ground floor with one to six and nine additional storied structures without basement); shallow footing (i.e. isolated square footing & raft foundation) is analyzed & presented below.

In view of liquefiable strata up to 13.5 m to 15.0 m depth in BH-1 to BH-6, the shallow footing (i.e. isolated square footing & raft foundation) is not feasible for the proposed structure. If we consider the liquefiable strata within 13.5 to 15.0 m depth below EGL, the shallow footing may not be feasible for any structure (i.e. even for the single to multistoried structure).

However the indicative value of Safe /allowable bearing capacity is analyzed for the shallow footing and attached herewith but not recommended. The load carrying capacity of bored cast in situ pile is also analyzed & bored cast in situ pile (only) recommended for execution at the project site.

The sub soil water level at the project site was observed at **3.15 m to 3.25 m** depth below existing G.L. in pre monsoon season during drilling period in the month of **April-2024**. ***The project site is located at Approx. 19.6 KM from Parmman River. As per local enquiry, it was reported that the observed water table may further rise up to/or above the existing ground surface during flood in River Parmman or in rainy season during heavy to very heavy rains in monsoon season.***

The load carrying capacity of bored cast in situ pile foundation is attached for ready reference & must be adopted for the proposed structure.

The provision of Earth quake consideration shall be taken as per relevant clause of IS 1893-2002.

6.1 ALLOWABLE BEARING CAPACITY :-

The allowable bearing pressure shall be lower of the values as obtained from above two considerations (i.e. shear failure criteria or settlement consideration) as per following table.

AEs

PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			
ALLOWABLE BEARING CAPACITY LOWER OF THE TWO CONSIDERATION			
DEPTH OF FOOTING Below EGL(m)	**WIDTH OF FOOTING (m)**	**LENGTH OF FOOTING (m)**	**NET ALLOWABLE BEARING CAPACITY (T/M2)**
			ISOLATED SQUARE FOOTING
1.50	1.00	1.00	8.00
1.50	2.00	2.00	7.60
1.50	3.00	3.00	7.35
2.00	1.00	1.00	8.50
2.00	2.00	2.00	8.10
2.00	3.00	3.00	7.80
			RAFT FOUNDATION
1.50	10.00	20.00	12.85
1.50	20.00	40.00	15.40
1.50	30.00	60.00	15.40
2.00	10.00	20.00	14.80
2.00	20.00	40.00	17.35
2.00	30.00	60.00	17.35

Remark:-The Permissible settlement for shallow footing (i.e. isolated square footing & raft foundation) has been adopted as 50 mm to 75 mm with sub soil water correction as 0.50 in all the analysis of safe bearing capacity.

6.2 PILE FOUNDATIONS

NORMAL BORED CAST – IN – SITU PILE FOUNDATIONS.:-

Normal bored cast–in-situ RCC pile foundations for the proposed multistoried structures (i.e. stilt/ground floor with one to six and nine additional storey without basement) has been analyzed & the safe load carrying capacity is determined in compression and uplift as per IS 2911,(Part – I / section – 2) – 1979. The effective length of pile has been considered below the cutt off level. The cutt off level of pile has been considered at 1.0 m below existing ground level considering pile cap etc depending upon structural requirement.

Normal bored cast – in – situ RCC piles having stem dia. equal to 45.0 cm to 75.0 cm of lengths 18.0 m to 30.0 m were selected.(In view of limited depth of investigation, the sub soil parameter of 15.0 m to 30.0 depth is considered same as sub soil of 15.0 m depth.

The value of safe load carrying capacities of pile based on soil properties in compression & uplift has been tabulated below.

PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.

SUB SOIL PARAMETER ,

Depth Below Existing Ground Level (m)		Layer Thickness (cm)	SPT N Values	Cohesion (Kg/cm2)	Angle of Internal Friction (Degree)	Bulk Density (T/m3)
GL	5.00	500.00	5 to 9	0.00	28.50	1.65
5.00	8.00	300.00	13 to 16	0.00	29.50	1.70
8.00	11.00	300.00	17 to 20	0.00	30.50	1.73
11.00	15.00	400.00	19 to 24	0.90	31.50	1.77

PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.

BORED CAST – IN – SITU PILE FOUNDATIONS,

Stem Dia of Pile (CM)	Length of pile below cutt off level (M)	Use full Length of pile within non liquefiable strata (M)	Cutt Off Level Below Basement Level (CM)	safe load carrying capacity of single pile			
				Depth of Fixity (M)	Net Safe comp (Kgf)=Safe comp-Dead Weight (T)	In uplift (T)	Lateral Load (T)
45.00	18.00	4.00	100.00	19.85	27.41	11.42	0.05
45.00	22.00	8.00	100.00	19.85	54.37	25.70	0.05
45.00	26.00	12.00	100.00	19.85	87.05	42.83	0.05
45.00	30.00	22.00	100.00	19.85	123.81	62.82	0.05
60.00	18.00	4.00	100.00	21.36	45.52	15.23	0.12
60.00	22.00	8.00	100.00	21.36	80.77	34.26	0.12
60.00	26.00	12.00	100.00	21.36	123.62	57.11	0.12
60.00	30.00	22.00	100.00	21.36	170.27	83.76	0.12
75.00	18.00	4.00	100.00	22.80	72.47	19.04	0.23
75.00	22.00	8.00	100.00	22.80	115.64	42.83	0.23
75.00	26.00	12.00	100.00	22.80	168.32	71.39	0.23
75.00	30.00	22.00	100.00	22.80	223.05	104.70	0.23

NOTE :-.THE FACTOR OF SAFETY IN UPLIFT CAPACITY HAS BEEN TAKEN AS 5 (AS PER IRC-78-2000) . THE LATERAL LOAD CAPACITY OF PILE IS CALCULATED CONSIDERING M35 GRADE CONCRETE. The Net safe compression has been worked out by deducting Pile weight .

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Remark:-

1. The safe load carrying capacity of piles have been worked out on the basis of IS: 2911(Part- I/Sec. 2) – 1978 & IS: 2911 part – III – 1980 as per the assumptions and specification. The safe loads obtained above are only an assessment based on soil characteristics obtained from the test locations. Accordingly , as per IS specification & as per clause of IS 2911(Part – I – sec. 2) - 1979 & 5.2.3.2. of IS 2911(Part – III/ Sec. 2) – 1980 for the final design / construction of foundations, the safe / allowable load carrying capacity of these piles should be verified by conducting actual initial load tests on the piles casted in representative area. The actual load carrying capacity of pile given in table may vary due to difference in the assumptions of analysis and actual site condition during pile load test.
2. The piles should have necessary structural strength to transmit/sustain the design loads.
3. The safe load capacity of piles in up lift will be limited to the structural capacity of the piles in tension due to uplift if the same is lower.
4. Since pile is recommended at this site and water table is also likely to rise in monsoon season hence pile should be constructed essentially with use of TREMIE PIPE. The tremie pipe should be of equal to pile length size. This can be fabricated either in small length which shall be jointed at site while lowering into the bore hole
5. The tremie should be provide with a flap so that instantaneous pouring of concrete can be done in borehole.
6. The pile should be constructed essentially by a very competent agency, who has proper equipments and trained manpower and who has earlier constructed piles below water table situation. The agency should submit satisfactory performance reports from its earlier clients of repute.
7. At clayey soils, the mud formation is very common at the bottom of bore hole. Therefore at least 1 feet size stone material should be poured in borehole, followed by PCC (1:6:12), with the help of tremie. When it is set properly, the reinforcement cage should be lowered and poured with the help of tremie.

8. One initial load test and one routine load test should be carried out on pile constructed by a very competent agency under the supervision of an expert construction/ geotechnical/foundation engineer. Minimum three to five nos. NDT tests should also be carried out on pile to assess the construction quality of piles. These test should also be carried out by those agencies who have sufficient experience in the area and have properly calibrated equipment.

9.Structural designer may take into account the affect of seismic loading also**.**

6.3 CHEMICAL ANALYSIS OF WATER AND SOIL SAMPLE.

Two numbers water & three numbers samples has been collected from the bore holes at different depths and examined for chemical content. The test results are tabulated as per following.

SOIL CHEMICAL ANALYSIS OF SOIL SAMPLE,
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.

SL NO	LOCATIONS BH NO	Depth of Sample Below EGL(m)	PERMISSIBLE LIMIT								
			Chloride as CL % by Mass (Volhards Method)	Sulphate as SO4 % by Mass (Gravimetric)	Calcium (as Ca)	Magnesium (as Mg)	Total Alkalinity, as CaCO3	Potassium (as K)	Sodium (as Na)	Nitrate (as N2O3)	pH as Per IS 2720Pt 26
			<0.05 %	<0.04 %	Max 75	Max 30	Max 200	0.30-0.70 Meq/100 g	(0.30 - 0.70) Mg/ Kg	(0.030-0.070) %	>6.0
1	BH-1	1.50	0.025	0.025	50.20	18.30	164.80	0.52	0.40	0.05	6.91
2	BH-3	2.50	0.028	0.022	44.70	16.40	162.35	0.49	0.36	0.04	6.80
3	BH-5	3.00	0.030	0.018	38.20	14.50	149.86	0.41	0.34	0.03	6.75

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CHEMICAL ANALYSIS OF WATER SAMPLE, PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.						
SL NO	**LOCATION (BH No)**	**DEPTH (M)**		**pH VALUES**	**Chloride MG/L**	**SULPHATE MG/L**
			ACCEPEPTING CRITERIA AS PE IS 456-2000.	**>6**	**500 MG/L**	**400 MG/L**
1.0	**BH-2**	**5.5**		56.10	39.60	6.90
2.0	**BH-5**	**9.0**		35.60	25.00	6.78

Remark:-The chemical examination of soil and water samples was conducted as per IS specification. It is found that water samples confirms the provision of IS:456-2000.

6.4 CHEMICAL ANALYSIS OF WATER FOR DRINKING QUALITY (POTABILITY):-

PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.					
S. No.	**Chemical Parameters**	**Units**	**Methods**	**Results of Analysis**	**Desirable Limits (IS 10500:2012)**
1	Turbidity	NTU	IS 3025 Part 10:1984 Reaff. 2017	1.0	Max 1
2	Colour	Hazen Units,	IS 3025 Part 4:1983 Reaff. 2017 Amnd.1	<1.0	Max 5
3	pH Value	-	IS 3025 Part 11:1983 Reaff. 2017	6.95	6.5-8.5
4	Colour	-	IS 3025 Part 5: 2018	Agreeable	Agreeable
5	Taste	-	IS 3025 Part 8:1984 Reaff. 2017	-	Agreable
6	Electrical conductivity	µS/cm	IS 3025 Part 14:1984 Reaff. 2019	462	Not specified
7	Total Dissolved Solids	mg/L	IS 3025 Part 16:1984 Reaff. 2017 Amnd. 1	330	Max 500
8	Total Alkalinity, as CaCO3	mg/L	IS 3025 Part 23:1986 Reaff. 2019	150	Max 200
9	P. Alkalinity, as CaCO3	mg/L	IS 3025 Part 23:1986 Reaff. 2019	<1.0	Not specified
10	Total Hardness, as CaCO3	mg/L	IS 3025 Part 21:2009 Reaff. 2019	**170**	Max 200
11	Chloride, as Cl	mg/L	IS 3025 Part 32:1988 Reaff. 2019	**72**	Max 250
12	Calcium, as Ca	mg/L	IS 3025 Part 40:1991 Reaff. 2019	**45**	Max 75
13	Magnesium, as Mg	mg/L	IS 3025 Part 46:1994 Reaff.	**15**	Max 30

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			2019		
14	Sulphate, as SO4	mg/L	IS 3025 Part 24:1986 Reaff. 2019	**36**	Max 200
15	Reactivity Silica, as Sio2	mg/L	IS 3025 Part 35:1988 Reaff. 2019	5	Not specified
S. No.	**Microbiological Parameters**	**Units**	**Methods**	**Resultes of Analysis**	**Desirable Limits (IS 10500:2012)**
1	Total Bacterial Count	cfu/ml	IS 3025 Part 35:1988 Reaff. 2019	$5.3x10^3$	Not specified
2	Coliform	cfu/100 ml	IS: 15185:2016	Not Detectable	Not Detectable
3	Escherichia Coli	cfu/100 ml		Not Detectable	Not Detectable

Remarks:–Based on above tested parameter, the water sample has been examined for portability/drinking quality as per IS 10500:2012 & the contents are within Acceptable limit hence water is fit for drinking purpose. However it is recommended to extract the water from deep well & must be validated/ checked from the local Municipal authority before any domestic use. The water from shallow depth will not be used for drinking purpose which is vulnerable to be contaminated easily due to external factor.

6.5 TERMITE TEST IN SOIL:-

Termites are key soil bioturbators in tropical ecosystems. Apart from mound nests constructed by some advanced lineages, most of the species use their faeces, oral secretions, debris, or soil aggregates to protect themselves from predators and desiccation when they go out to forage.

Remark:- The soil sample does not contains the termites in it.

Disclaimer:-The above recommendations are based on the field data collected from the various limited test locations and result of laboratory test carried out on the soil sample recovered from test bore holes. In case the proposed structure are located away from the tests location and/ or the actual subsoil conditions varied during the excavation for various foundation and found to be different from what has been reported above, additional investigation would be needed prior to taking up to actual construction work at site.

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ALLIED ENGINEERS JOB NO. M-5/2024-25/3177 **SOIL PROFILE**	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.20 (M)**	LOCATION **BH-1 N:-26°09'50.4" E:-87°24'57.1"**	**SHEET-1**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS				HYDROM ANALY	ATTERBERGS' LIMITS				DENSITY gm / cm³		MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL		CONSOLIDATION PARAMETER		STD. PROCTOR TEST MDD GM/CC/OMC %
						GRAVEL	COARSE	MEDIUM	FINE	SILTY+ CLAY %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	BULK DENSITY	DRY DENSITY					COHESION (C) (KG/CM²)	FRICTION ANGLE (Ø)	VOID RATIO	COMPRESSION INDEX	
GL																									
SPT	1.50			5	7																				
UDS	**2.00**					0	1	4	78	17					1.65	1.51	9.25	2.65			0.00	**DST** 28.5	0.75		
SPT	3.00			7	9																				
SPT	4.50			9	11																				
UDS	**5.00**					0	1	18	66	15					1.70	1.53	10.80	2.65		**Remoulded**	0.00	**DST** 29.5	0.73		
SPT	6.00			13	15																				
SPT	7.50		Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)	16	16																				
UDS	**8.00**					1	1	21	63	14					1.73	1.56	11.00	2.65		**Remoulded**	0.00	**DST** 30.5	0.70		
SPT	9.00			17	16																				
SPT	10.50			20	17																				
UDS	**11.00**					1	1	20	65	13					1.75	1.57	11.25	2.65		**Remoulded**	0.00	**DST** 31.0	0.68		
SPT	12.00			19	16																				
SPT	13.50			23	18																				
UDS	**14.00**					1	1	22	64	12					1.77	1.59	11.50	2.65		**Remoulded**	0.00	**DST** 31.5	0.67		
SPT	15.00			24	18																				
	15.45																								

ALLIED ENGINEERS JOB NO. M-5/2024-25/3177	SOIL PROFILE	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.25 (M)**	LOCATION **BH-2 N:-26°09'48.3" E:-87°24'55.2"**	**SHEET-2**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS				HYDROM ANALY	ATTERBERGS' LIMITS				DENSITY gm / cm³		MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL		CONSOLIDATION PARAMETER		STD. PROCTOR TEST MDD GM/CC/OMC %
						GRAVEL	COARSE	MEDIUM	FINE	SILTY+ CLAY %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	BULK DENSITY	DRY DENSITY					COHESION (C) (KG/CM²)	FRICTION ANGLE (Ø)	VOID RATIO	COMPRESSION INDEX	
GL																									
SPT	1.50			6	8																				
UDS	**2.00**					0	1	5	75	19					1.69	1.54	9.65	2.65			0.00	**DST** 29.5	0.72		
SPT	3.00			11	14																				
SPT	4.50			10	12																				
																Remoulded									
UDS	**5.00**					0	1	17	65	17					1.72	1.55	11.00	2.65			0.00	**DST** 30.0	0.71		
SPT	6.00			14	15																				
SPT	7.50			17	17																				
																Remoulded									
UDS	**8.00**		Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)			1	1	20	62	16					1.74	1.56	11.25	2.65			0.00	**DST** 30.5	0.69		
SPT	9.00			15	15																				
SPT	10.50			20	17																				
																Remoulded									
UDS	**11.00**					1	1	22	63	13					1.77	1.59	11.50	2.65			0.00	**DST** 31.0	0.67		
SPT	12.00			24	19																				
SPT	13.50			23	18																				
																Remoulded									
UDS	**14.00**					1	1	18	65	15					1.79	1.59	12.50	2.65			0.00	**DST** 31.5	0.67		
SPT	15.00			26	19																				
	15.45																								

ALLIED ENGINEERS JOB NO. M-5/2024-25/3177 **SOIL PROFILE**	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.20 (M)**	LOCATION **BH-3 N:-26°09'45.8" E:-87°24'56.5"**	**SHEET-3**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS GRAVEL	COARSE	MEDIUM	FINE	HYDROM ANALY SILTY+ CLAY %	ATTERBERGS' LIMITS LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	DENSITY gm/cm³ BULK DENSITY	DRY DENSITY	MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL COHESION (C) (KG/CM²)	FRICTION ANGLE (ø)	CONSOLIDATION PARAMETER VOID RATIO	COMPRESSION INDEX	STD. PROCTOR TEST MDD GM/CC/OMC %
GL																									
SPT	1.50			7	10																				
UDS	**2.00**					0	1	3	76	20					1.68	1.53	9.55	2.65			0.00	**DST** 29.0	0.73		
SPT	3.00			8	10																				
SPT	4.50			10	11																				
															Remoulded										
UDS	**5.00**					0	1	19	64	16					1.71	1.54	10.85	2.65			0.00	**DST** 30.0	0.72		
SPT	6.00			13	14																				
SPT	7.50			15	15																				
															Remoulded										
UDS	**8.00**		Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)			1	1	17	66	15					1.73	1.56	11.20	2.65			0.00	**DST** 30.5	0.70		
SPT	9.00			17	16																				
SPT	10.50			20	17																				
															Remoulded										
UDS	**11.00**					1	1	20	65	13					1.75	1.57	11.45	2.65			0.00	**DST** 31.0	0.69		
SPT	12.00			22	17																				
SPT	13.50			23	18																				
															Remoulded										
UDS	**14.00**					1	1	21	63	14					1.78	1.59	12.00	2.65			0.00	**DST** 31.5	0.67		
SPT	15.00			26	19																				
	15.45																								

ALLIED ENGINEERS JOB NO. M-5/2024-25/3177 **SOIL PROFILE**	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.15 (M)**	LOCATION **BH-4 N:-26°09'44.4" E:-87°24'59.9"**	**SHEET-4**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS GRAVEL	COARSE	MEDIUM	FINE	HYDROM ANALY SILTY+ CLAY %	ATTERBERGS' LIMITS LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	DENSITY gm/cm³ BULK DENSITY	DRY DENSITY	MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL COHESION (C) (KG/CM²)	FRICTION ANGLE (ø)	CONSOLIDATION PARAMETER VOID RATIO	COMPRESSION INDEX	STD. PROCTOR TEST MDD GM/CC/OMC %
GL																									
SPT	1.50			6	8																				
UDS	**2.00**					0	1	5	77	17					1.70	1.55	9.80	2.65			0.00	**DST** 29.5	0.71		
SPT	3.00			11	14																				
SPT	4.50			10	12																				
															Remoulded										
UDS	**5.00**					0	1	18	66	15					1.73	1.56	10.91	2.65			0.00	**DST** 30.0	0.70		
SPT	6.00			14	15																				
SPT	7.50			18	17																				
			Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)												**Remoulded**										
UDS	**8.00**					1	1	20	62	16					1.75	1.57	11.50	2.65			0.00	**DST** 31.0	0.69		
SPT	9.00			21	18																				
SPT	10.50			24	19																				
															Remoulded										
UDS	**11.00**					1	1	22	63	13					1.77	1.58	12.00	2.65			0.00	**DST** 31.0	0.68		
SPT	12.00			22	18																				
SPT	13.50			25	19																				
															Remoulded										
UDS	**14.00**					1	1	20	64	14					1.80	1.60	12.75	2.65			0.00	**DST** 31.5	0.66		
SPT	15.00			26	19																				
	15.45																								

ALLIED ENGINEERS JOB NO. M-5/2024-25/3177 **SOIL PROFILE**	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.25 (M)**	LOCATION **BH-5 N:-26°09'48.8" E:-87°25'02.9"**	**SHEET-5**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS GRAVEL	COARSE	MEDIUM	FINE	HYDROM ANALY SILTY+ CLAY %	ATTERBERGS' LIMITS LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	DENSITY gm / cm³ BULK DENSITY	DRY DENSITY	MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL COHESION (C) (KG/CM²)	FRICTION ANGLE (Ø)	CONSOLIDATION PARAMETER VOID RATIO	COMPRESSION INDEX	STD. PROCTOR TEST MDD GM/CC/OMC %
GL																									
SPT	1.50			5	7																				
UDS	**2.00**					0	1	3	78	18					1.67	1.53	9.38	2.65			0.00	**DST** 28.5	0.74		
SPT	3.00			10	12																				
SPT	4.50			9	10																				
															Remoulded										
UDS	**5.00**					0	1	20	62	17					1.70	1.54	10.45	2.65			0.00	**DST** 29.5	0.72		
SPT	6.00			12	13																				
SPT	7.50			15	15																				
			Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)												**Remoulded**										
UDS	**8.00**					1	1	18	65	15					1.74	1.57	11.00	2.65			0.00	**DST** 30.5	0.69		
SPT	9.00			16	15																				
SPT	10.50			20	17																				
															Remoulded										
UDS	**11.00**					1	1	20	66	12					1.77	1.59	11.60	2.65			0.00	**DST** 31.0	0.67		
SPT	12.00			24	18																				
SPT	13.50			25	18																				
															Remoulded										
UDS	**14.00**					1	1	21	62	15					1.79	1.59	12.40	2.65			0.00	**DST** 31.5	0.66		
SPT	15.00			27	19																				
	15.45																								

ALLIED ENGINEERS JOB NO. M-5/2024-25/3177 **SOIL PROFILE**	**SOIL INVESTIGATION FOR CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**	WATER TABLE **3.20 (M)**	LOCATION **BH-6 N:-26°09'45.6" E:-87°25'10.7"**	**SHEET-6**

TYPE OF SAMPLE	DEPTH (m)	SUB SOIL PROFILE	SOIL DISCRIPTION AND CLASSIFICATION	SPT 'N' VALUES(Measured)	SPT 'N' VALUES(Corrected)	GRAIN SIZE DISTRIBUTION SIEVE ANALYSIS GRAVEL	COARSE	MEDIUM	FINE	HYDROM ANALY SILTY + CLAY %	ATTERBERGS' LIMITS LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SHRINKAGE LIMIT	DENSITY gm / cm³ BULK DENSITY	DRY DENSITY	MAX MOISTURE CONTENT (%)	SPECIFIC GRAVITY	FREE SWELINDEX (%)/ SWELL PRESSURE	RELATIVE DENSITY	SHEARPARAMET UCC,TXL COHESION (C) (KG/CM²)	FRICTION ANGLE (ϕ)	CONSOLIDATION PARAMETER VOID RATIO	COMPRESSION INDEX	STD. PROCTOR TEST MDD GM/CC/OMC %
GL																									
SPT	1.50			6	8																				
UDS	**2.00**					0	1	4	75	20					1.66	1.52	9.15	2.65			0.00	**DST** 29.0	0.74		
SPT	3.00			8	10																				
SPT	4.50			10	12																				
															Remoulded										
UDS	**5.00**					0	1	18	63	18					1.72	1.56	10.25	2.65			0.00	**DST** 30.0	0.70		
SPT	6.00			12	14																				
SPT	7.50			14	15																				
															Remoulded										
UDS	**8.00**		Light grayish/blackish colour Inorganic fine silty sand of non plasticity (SP-SM)			1	1	21	62	15					1.74	1.57	10.75	2.65			0.00	**DST** 30.5	0.69		
SPT	9.00			16	16																				
SPT	10.50			19	17																				
															Remoulded										
UDS	**11.00**					1	1	19	65	14					1.76	1.58	11.50	2.65			0.00	**DST** 31.0	0.68		
SPT	12.00			22	18																				
SPT	13.50			26	19																				
															Remoulded										
UDS	**14.00**					1	1	21	64	13					1.78	1.59	12.25	2.65			0.00	**DST** 31.5	0.67		
SPT	15.00			28	20																				
	15.45																								

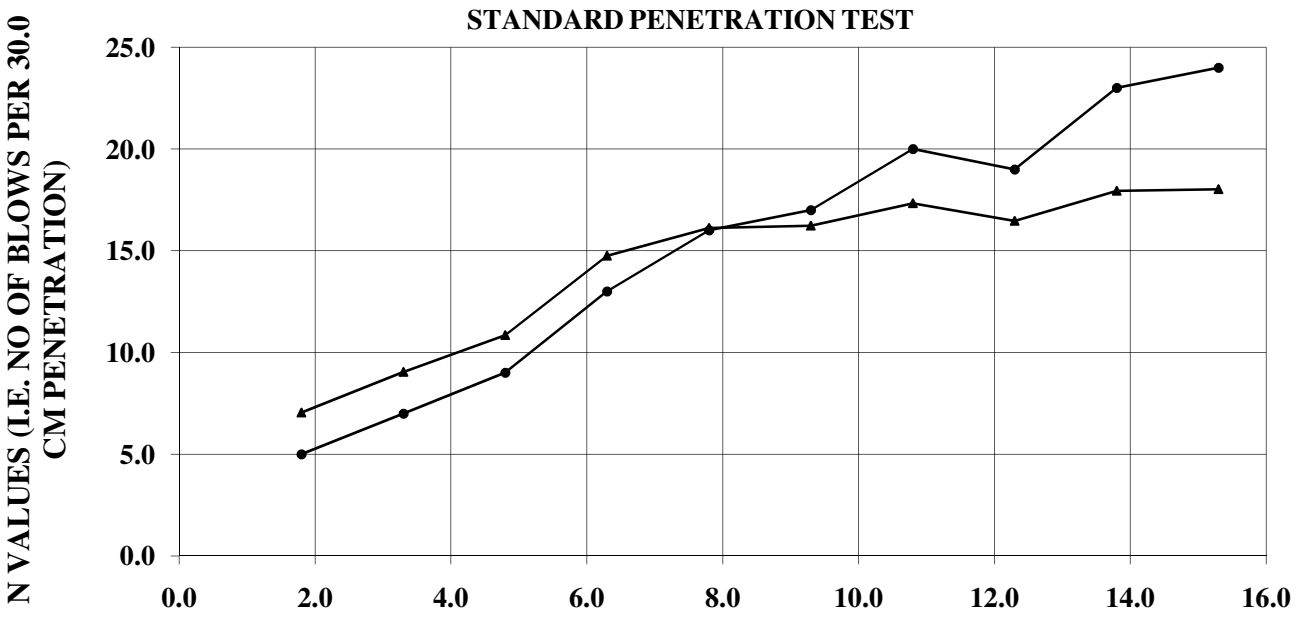
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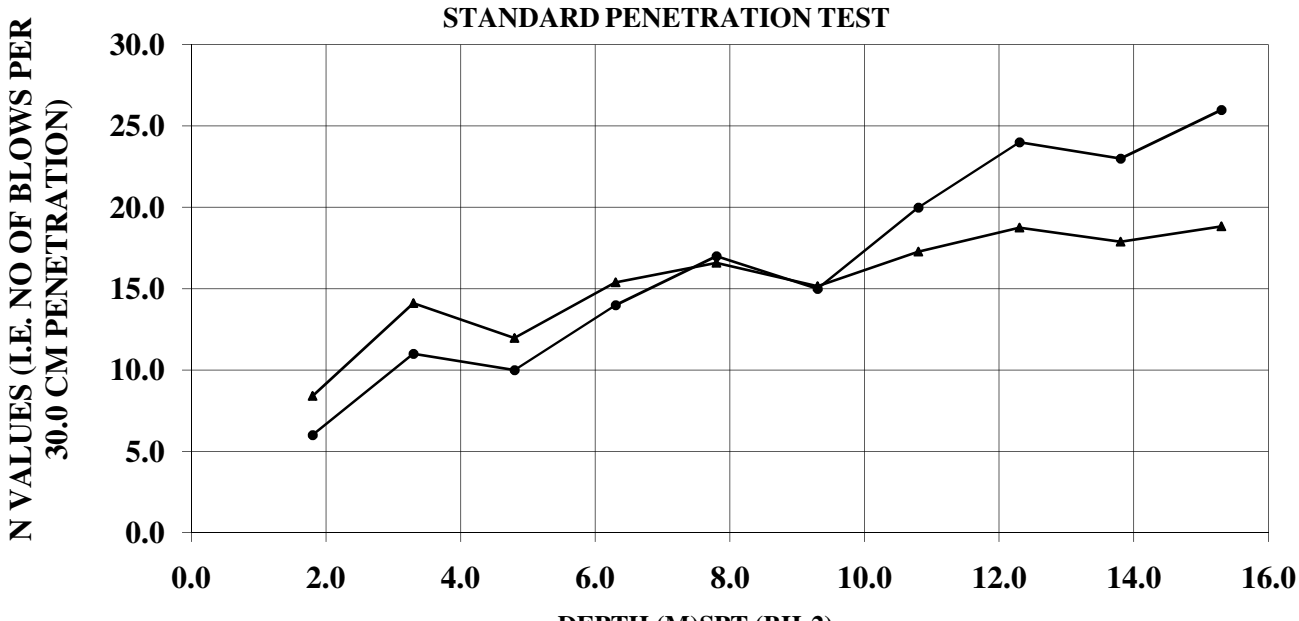
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DEPTH (M)SPT (BH-1),
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.(OBESRVED VALUES, ▲ CORRECTED VALUES)



DEPTH (M)SPT (BH-2),
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.(● OBESRVED VALUES, ▲ CORRECTED VALUES)

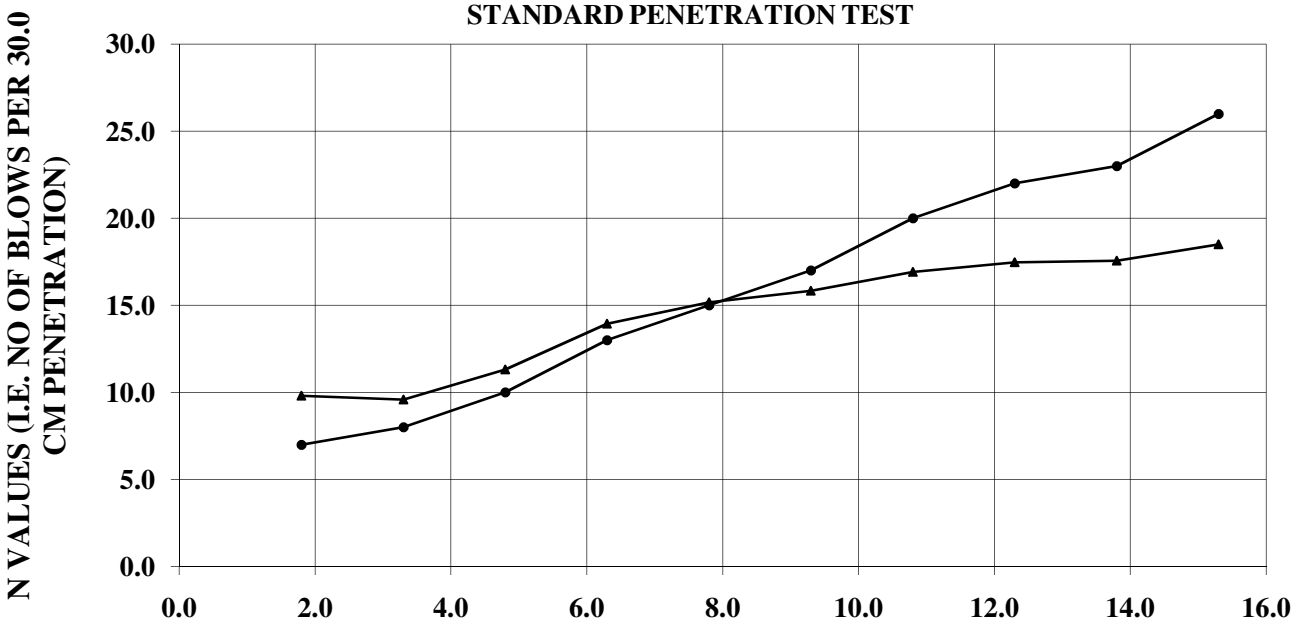
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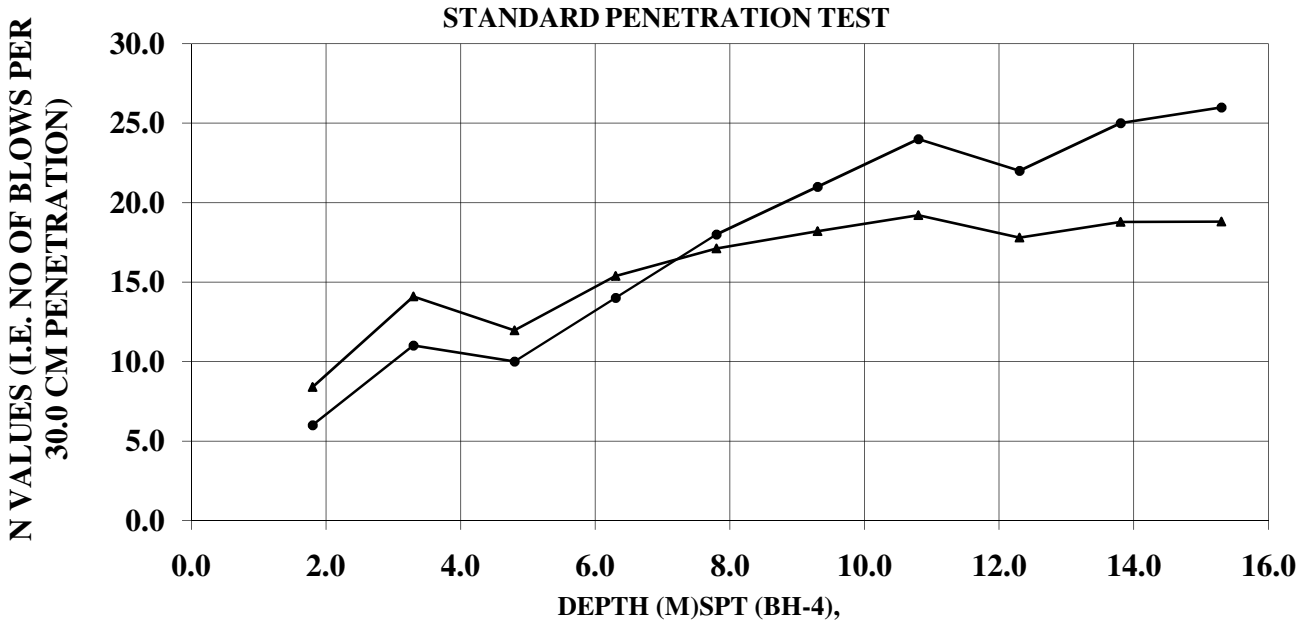
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DEPTH (M)SPT (BH-3),
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.(OBESRVED VALUES, ▲ CORRECTED VALUES)



DEPTH (M)SPT (BH-4),
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.(● OBESRVED VALUES, ▲ CORRECTED VALUES)

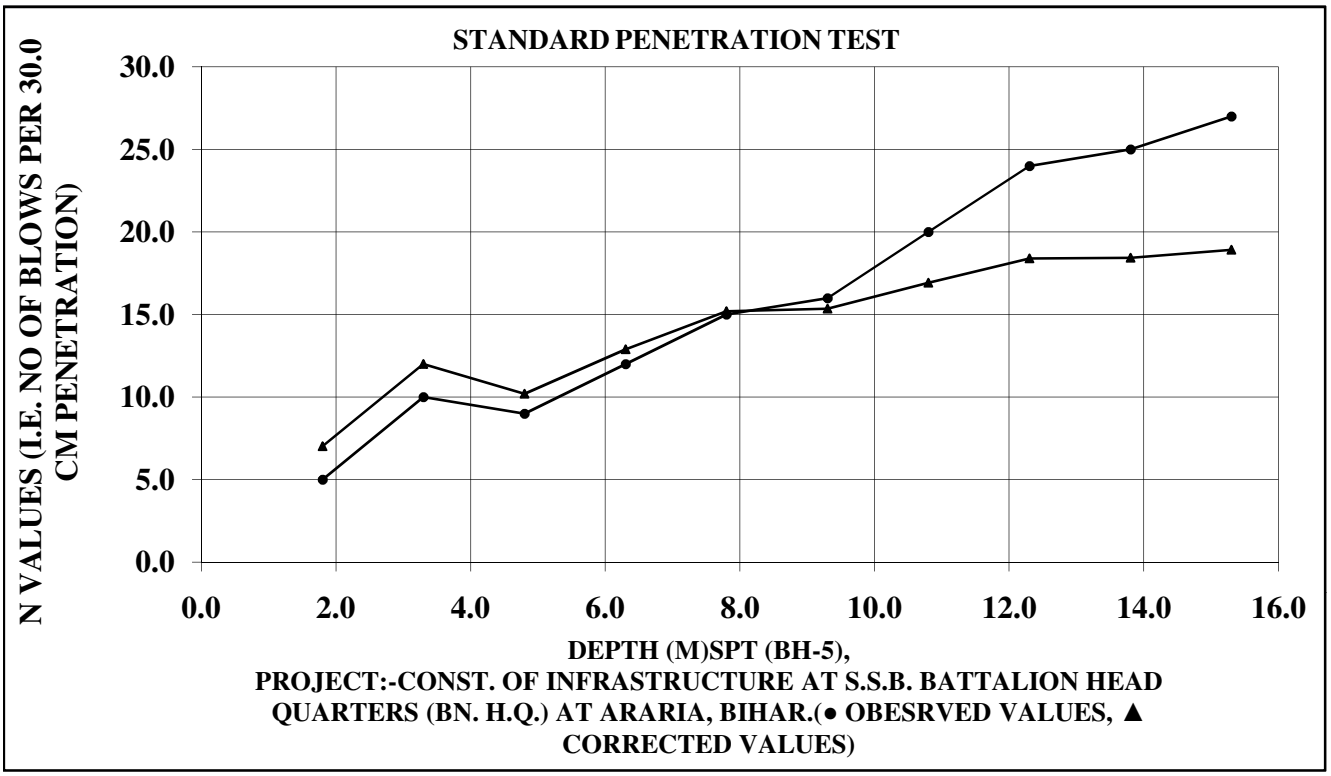
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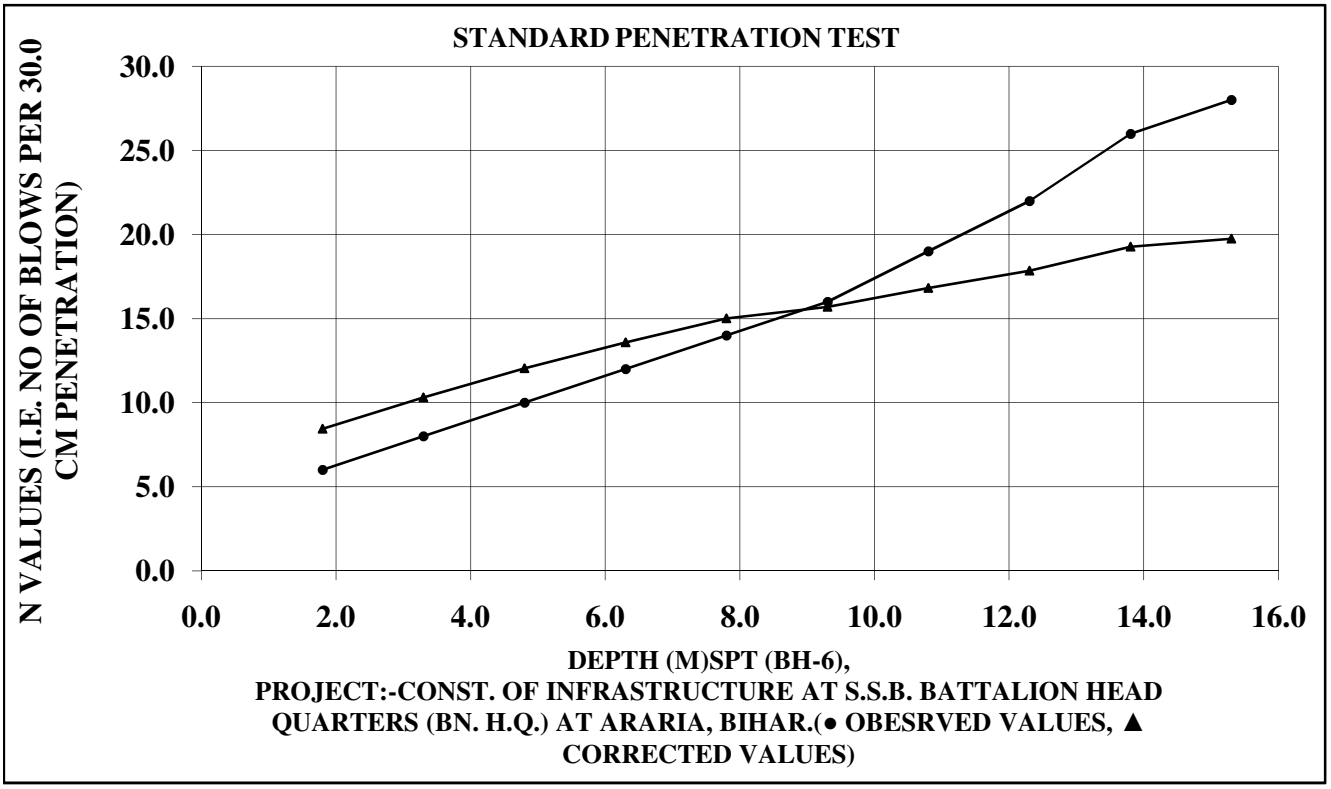
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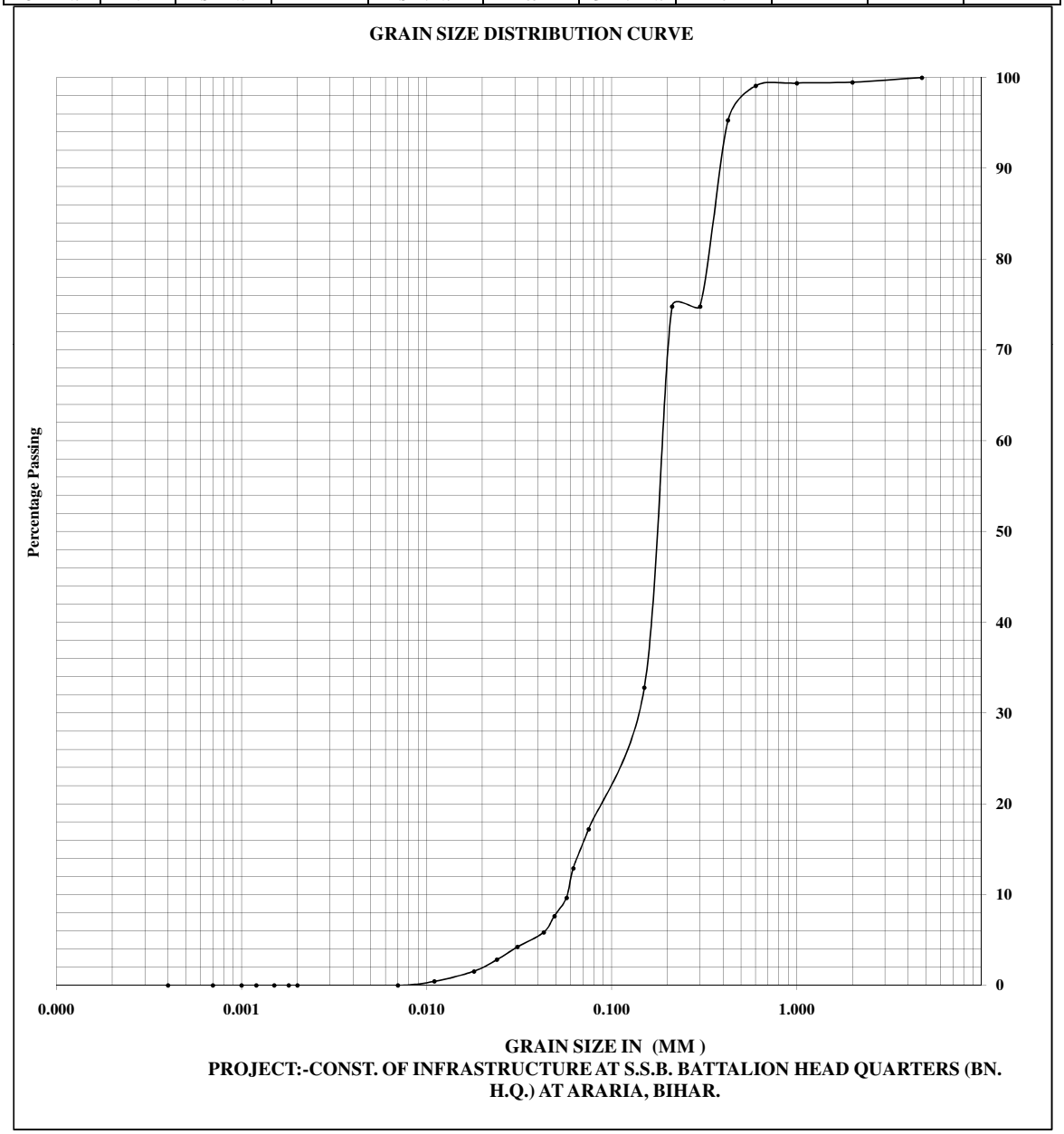
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GRAIN SIZE DISTRIBUTION CURVE

Client	**CHIEF ENGINEER, CONSTRUCTION MANAGEMENT UNIT-III, WAPCOS LTD.**									
Project	**CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.**									
Location				**Date**		**5/6/2024**				
BH. NO.	**1**	**DEPTH IN (M)**		**2.00 M-2.30 M**		**IS:2720 (PT-4)1985**				
RANGE	**Clay (µ)**		**Silt (µ)**	**Fine Sand (µ)**	**Mediam**		**CoarseSand**	**Gravel**	**Cobbel**	**Boulder**
	0.001	<0.002	<0.075	<0.425	<2.0		>2	>4.75	>75	>300
CLAY %	**0**	**SILT%**	**17**	**SAND%**	**83**	**GRAVEL%**	0			



GSTIN : 07AALFA8460D1ZH

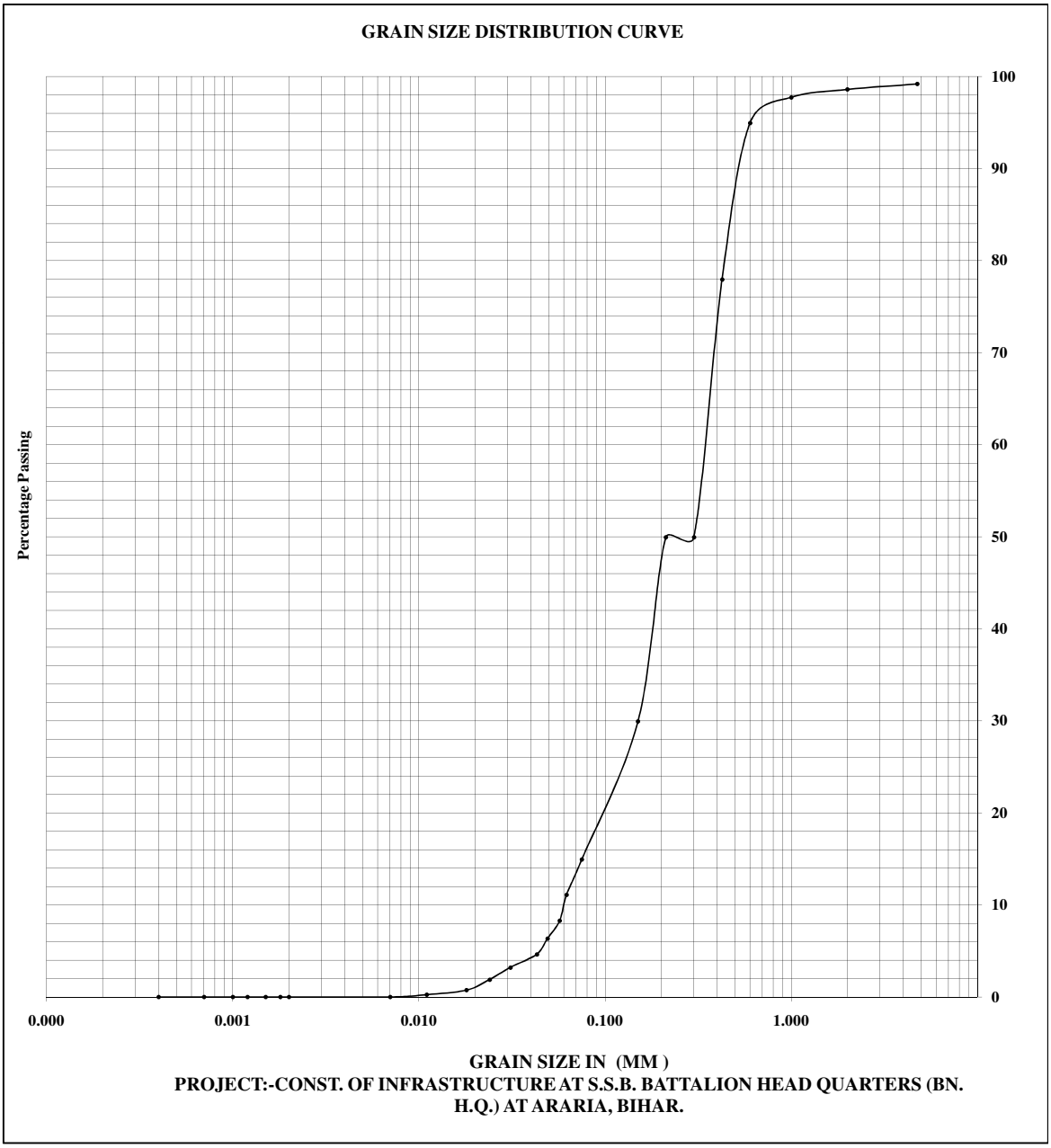
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GRAIN SIZE DISTRIBUTION CURVE										
Client	CHIEF ENGINEER, CONSTRUCTION MANAGEMENT UNIT-III, WAPCOS LTD.									
Project	CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.									
Location				Date		5/6/2024				
BH. NO.	1	DEPTH IN (M)		8.00 M-8.30 M		IS:2720 (PT-4)1985				
RANGE	Clay (µ)		Silt (µ)	Fine Sand (µ)	Mediam		CoarseSand	Gravel	Cobbel	Boulder
	0.001	<0.002	<0.075	<0.425	<2.0		>2	>4.75	>75	>300
CLAY %	0	SILT%	14	SAND%	85	GRAVEL%	1			



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Evaluation of Liquefaction Potential Based on SPT(CRR)					PROJECT:-CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN HQRS SSB, ARARIA, BIHAR.									
		Pa			1.0	Kg/cm2								
Depth Of Water Table Assumed					3.15	M								
Depth Below GL(m)	SPT Field Obsrved Value	Bulk density of Soil(Kg/cm2*m)	Density of Water(Kg/cm2*m)	Total Stress Ts	Hydrostatic Pressure Hs	Effective Stress Es(kg/cm2)	% Finer content (FC)	Cσ=1/(18.9-17.3Dr) <=0.3 as per Eq 13 P39	Overburden Correction factor Kσ =(1-Cσ*Ln(σ' v0))as per Eq 12 P39 <=1.0	Cn(Overburden/normalization) =(1/EStress)power m as per Eq 19P40	N1-60(Normalization Factor diamensionless) qty =Cn*qc as per Eq 3 P33	N1-60 cs (Clean Sand =(N1)60 +Δ (N1)60as per Eq 25 P44	Δ (N1)=exp((1.63+9.7/FC-(15.7/FC)2)as per Eq 26 P44	Relative DensityDr =0.478(qc1n)Power 0.264-1.063Eq 14 P39
1.80	5	0.165		0.30		0.2970	19	0.091	1.00	1.94	10	14	4.30	0.46
3.30	7	0.165	0.100	0.545	0.150	0.3945	17	0.097	1.00	1.63	11	15	3.85	0.50
4.80	9	0.165	0.100	0.792	0.300	0.4920	16	0.103	1.00	1.43	13	16	3.57	0.53
6.30	13	0.170	0.100	1.047	0.450	0.5970	15	0.117	1.00	1.28	17	20	3.26	0.60
7.80	16	0.170	0.100	1.302	0.600	0.7020	14	0.127	1.00	1.17	19	22	2.90	0.64
9.30	17	0.173	0.100	1.562	0.750	0.8115	16	0.127	1.00	1.10	19	22	3.57	0.64
10.80	20	0.173	0.100	1.821	0.900	0.9210	15	0.137	1.00	1.04	21	24	3.26	0.67
12.30	19	0.175	0.100	2.084	1.050	1.0335	14	0.127	1.00	0.99	19	22	2.90	0.64
13.80	23	0.175	0.100	2.346	1.200	1.1460	16	0.143	0.98	0.94	22	25	3.57	0.69
15.30	24	0.177	0.100	2.612	1.350	1.2615	15	0.143	0.97	0.91	22	25	3.26	0.69

GSTIN : 07AALFA8460D1ZH

Off.: 011-43215242
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PROJECT:-CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN HQRS SSB, ARARIA, BIHAR.

m=0.784-0.521Dr as per Eq20 P 40 Fig 11	N1-60 cs/14.1as Per Eq 27 P44 (Part) (A)	Square (N1-60 cs/126)as Per Eq 27 P44 (Part) (B)	Cube (N1-60 cs/23.6)as Per Eq 27 P44 (Part) (C)	Power4 (N1-60 cs/25.4)as Per Eq 27 P44 (Part) (D)	(A+B-C+D-28) as Per Eq 27 P44	Liquefaction Potential CRR =Exp((N1)60cs/14.1+((N1)60cs/126))2-((N1)60cs/23.6)3+((N1)60cs/25.4)4) as per Eq 27 P/44	Earthquake Moment Magnitude	Maximum Ground Accn (of g)	a(z)=-1.012-1.126 sin(z/11.73+5.133) as per eq 6bP34	bz=0.106+0.118 sin(z/11.28+5.142) as per eq 6cp34	rd=exp(a(z)+b(z)*M) as per Eq 6aP34	Magnitude scaling factor MSF=6.9*(exp(-M/4))-0.058 as per eq 8a P36	Cyclic Stress Ration Under Earthquake CSR m7.5=0.65*(σv0/σ'v0)rd/MSF as per Eq 23 P43	Factor Of Safety
0.54	0.99	0.01	0.21	0.09	-1.91	**0.1478**	7.50	0.360	-0.066	0.008	0.993	1.000	**0.232**	**0.636**
0.52	1.08	0.01	0.27	0.13	-1.84	**0.1582**	7.50	0.360	-0.152	0.017	0.979	1.000	**0.316**	**0.501**
0.51	1.17	0.02	0.34	0.18	-1.78	**0.1691**	7.50	0.360	-0.252	0.029	0.963	1.000	**0.363**	**0.466**
0.47	1.41	0.02	0.59	0.37	-1.59	**0.2039**	7.50	0.360	-0.364	0.041	0.945	1.000	**0.388**	**0.526**
0.45	1.54	0.03	0.77	0.53	-1.48	**0.2281**	7.50	0.360	-0.487	0.055	0.926	1.000	**0.402**	**0.568**
0.45	1.58	0.03	0.84	0.59	-1.44	**0.2370**	7.50	0.360	-0.618	0.069	0.906	1.000	**0.408**	**0.581**
0.43	1.70	0.04	1.05	0.80	-1.32	**0.2679**	7.50	0.360	-0.756	0.084	0.885	1.000	**0.409**	**0.655**
0.45	1.53	0.03	0.77	0.53	-1.48	**0.2274**	7.50	0.360	-0.898	0.100	0.863	1.000	**0.409**	**0.556**
0.43	1.79	0.04	1.23	0.98	-1.22	**0.2967**	7.50	0.360	-1.042	0.116	0.840	1.000	**0.410**	**0.723**
0.43	1.77	0.04	1.19	0.94	-1.24	**0.2900**	7.50	0.360	-1.185	0.131	0.818	1.000	**0.410**	**0.708**

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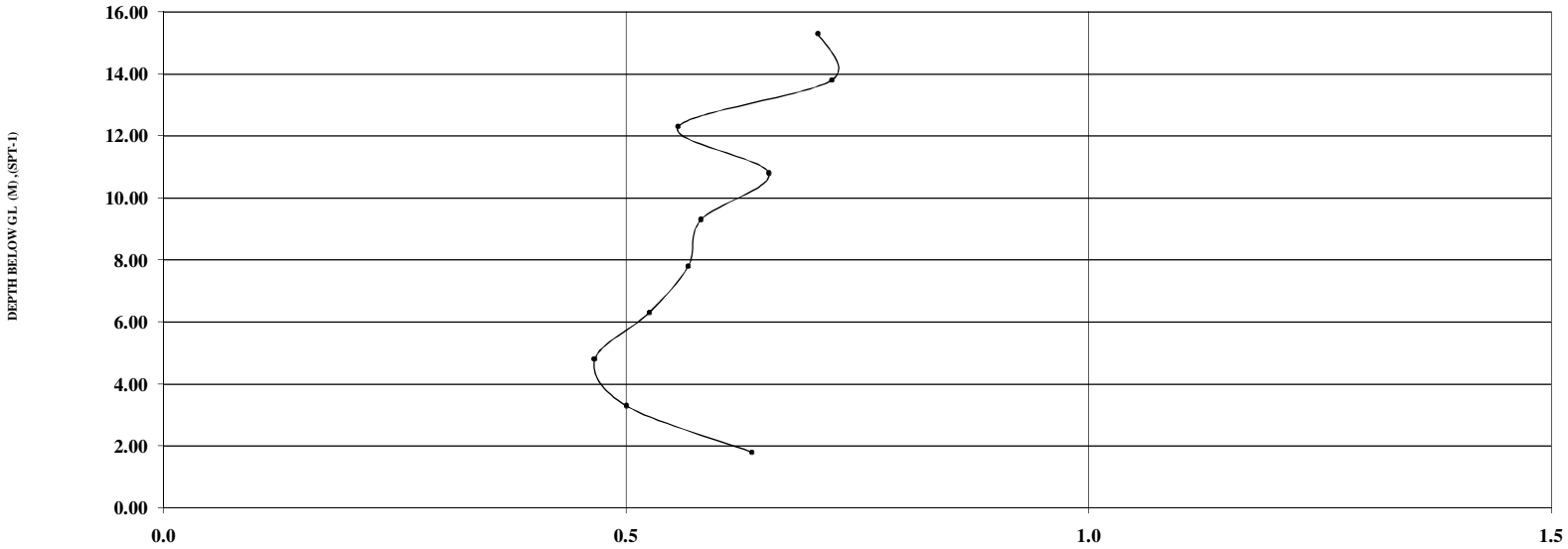
Off.: 011-43215242
M : 0-9350104466

ALLIED ENGINEERS

(Survey, Soil Investigation & Structural Engineer)

Off.: Flat No. 54A, ED Block, Pitampura, Delhi-110034
E-mail : alliedengineers77@gmail.com

LIQUIFACTION POTENTIAL OF SUB SOIL STRATA
PROJECT:-CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN HQRS SSB, ARARIA, BIHAR.
(MOMENT MAGNITUDE 7.50, MAX GROUND ACCELARATION 0.360 g)



FACTOR OF SAFETY (I.E. RATIO OF LIQUFACTION RESISTANCES OF THE SUB SOIL STARTA TO SHEAR STRESS INDUCES DUE TO EARTHQUAKE)
PROJECT:-CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BN HQRS SSB, ARARIA, BIHAR.

GSTIN : 07AALFA8460D1ZH

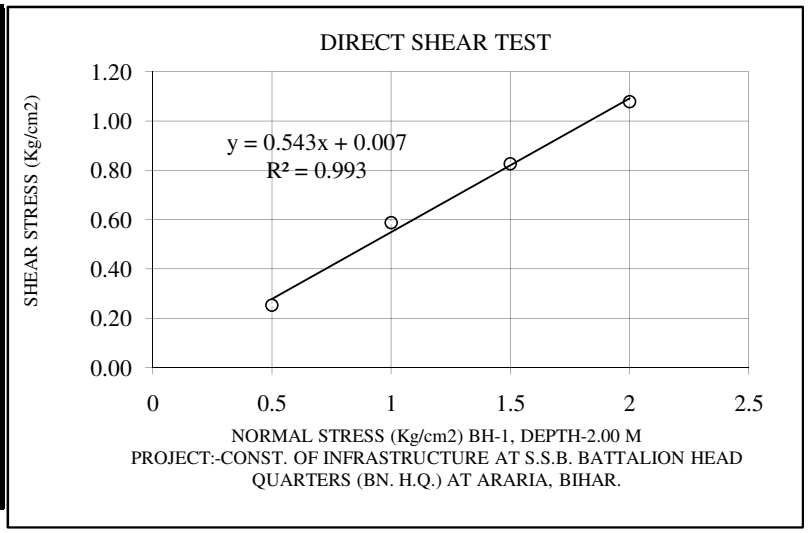
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ALLIED ENGINEERS

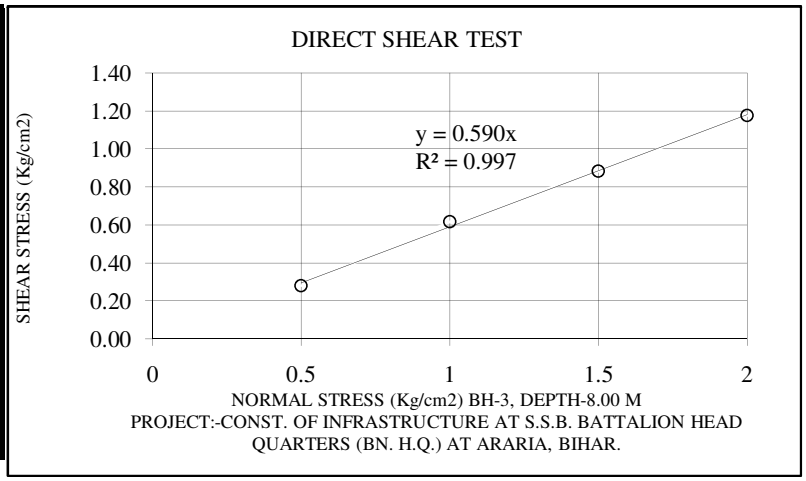
(Survey, Soil Investigation & Structural Engineer)

Off.: Flat No. 54A, ED Block, Pitampura, Delhi-110034
E-mail : alliedengineers77@gmail.com

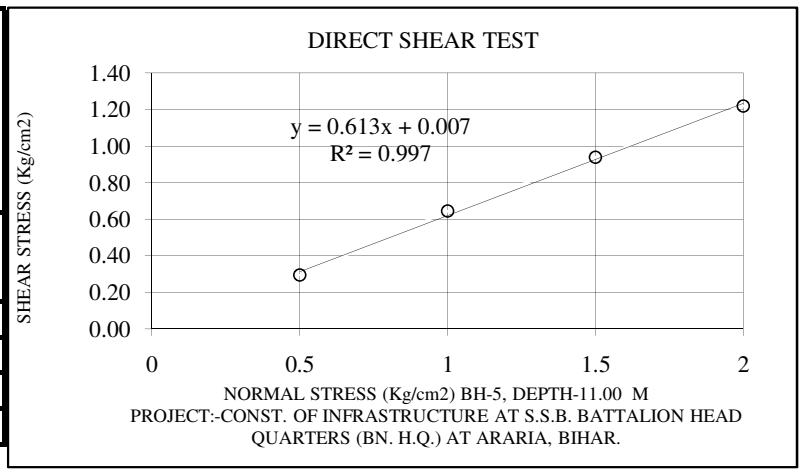
PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			BH-1	DEPTH-2.00 M
Normal stressσ Kg/cm2	**Proving ring divisions**	**shear stress kg/cm2**	**Angle of shear (phi)**	**Cohesion (c) Kg/cm2**
0.5	18	0.25		
1.0	42	0.59	**28.50**	**0.00**
1.5	59	0.83		
2.0	77	1.08		



PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			BH-3	DEPTH-8.00 M
Normal stressσ Kg/cm2	**Proving ring divisions**	**shear stress kg/cm2**	**Angle of shear (phi)**	**Cohesion (c) Kg/cm2**
0.5	20	0.28		
1.0	44	0.62	**30.50**	**0.00**
1.5	63	0.88		
2.0	84	1.18		



PROJECT:-CONST. OF INFRASTRUCTURE AT S.S.B. BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.			BH-5	DEPTH-11.00 M
Normal stressσ Kg/cm2	**Proving ring divisions**	**shear stress kg/cm2**	**Angle of shear (phi)**	**Cohesion (c) Kg/cm2**
0.5	21	0.29		
1.0	46	0.64	**31.50**	**0.00**
1.5	67	0.94		
2.0	87	1.22		



MASTER LAYOUT PLAN



SITE AREA= 42.38 ACRES

NO.	BLOCK NAME	AUTHORIZED PLINTH AREA	PROPOSED PLINTH AREA	TOTAL NO. OF FLOORS
1	ADMIN	1398.23 SQ.M.	1398.23 SQ.M.	Stilt+2
	OFFICES	1082.255Q.M.	1082.255Q.M.	Stilt+2
2	STORES	712.23SQ.M.	0.00Q.M.	G+1
3	QUARTER GUARD	527.835Q.M.	0.00Q.M.	GROUND FLOOR
4	TRADESMAN SHOT	131.135Q.M.	0.00Q.M.	GROUND FLOOR
5	MT GARAGE	606.85SQ.M.	0.00Q.M.	GROUND
6	HOSPITAL	742.575Q.M.	7425Q.M.	GROUND
7	SERVICE COY	327.995Q.M.	0.00Q.M.	GROUND
8	EXPLOSIVE MAGAZINE	88.485Q.M.	0.00Q.M.	GROUND FLOOR
9	SO'S MESS	426.58SQ.M.	0.00Q.M.	G+1
10	GO'S MESS	631.975Q.M.	0.00Q.M.	G+1
11	TRAINING SHED	371.75SQ.M.	0.00Q.M.	GROUND
12	180 MEN / WOMEN BARRACK	6267.30SQ.M.	2228.40SQ.M.	G+4(128 MEN PHASE I)
13	DOG KENNEL & PHARMACY (5 DOGS)	284SQ.M.	0.00Q.M.	GROUND FLOOR
14	CTC	200SQ.M.	0.00Q.M.	GROUND
15	FWC	300SQ.M.	0.00Q.M.	GROUND
16	SINGLE OFFICER	353.59SQ.M.	0.00Q.M.	GROUND
17	SINGLE SOS	398.14SQ.M.	0.00Q.M.	G+1
18	TYPE I 269/64 NOS.	16126.35SQ.M	4480SQ.M.	Stilt+9 (1 NOS. PHASE I)
19	TYPE II 45/24 NOS.	3258SQ.M.	1920SQ.M.	Stilt+6 (1 NOS. PHASE I)
20	TYPE IV 6NOS.	602.45Q.M.	76SQ.M.	Stilt+3
21	TYPE V 2NOS.	398.45Q.M.	401SQ.M.	G
22	PARADE GROUND	AS ACTUAL	0.00Q.M.	GROUND
23	OBSTACLE GROUND	AS ACTUAL		GROUND
24	PATHWAY	AS ACTUAL		GROUND
25	STP	AS ACTUAL		GROUND
26	WATCH TOWER	AS ACTUAL		GROUND
27	BOUNDARY WALL	AS ACTUAL		GROUND

HOLD LIST

SPECIAL NOTE

NOTE

REV.	DESCRIPTION	DATE	DRN	CHK	APP

PROJECT
PROJECT MANAGEMENT CONSULTANCY (PMC) SERVICES FOR CONSTRUCTION & DEVELOPEMENT OF INFRASTRUCTURE WORKS AT BN HQRS. SSB ARARIA (BIHAR)

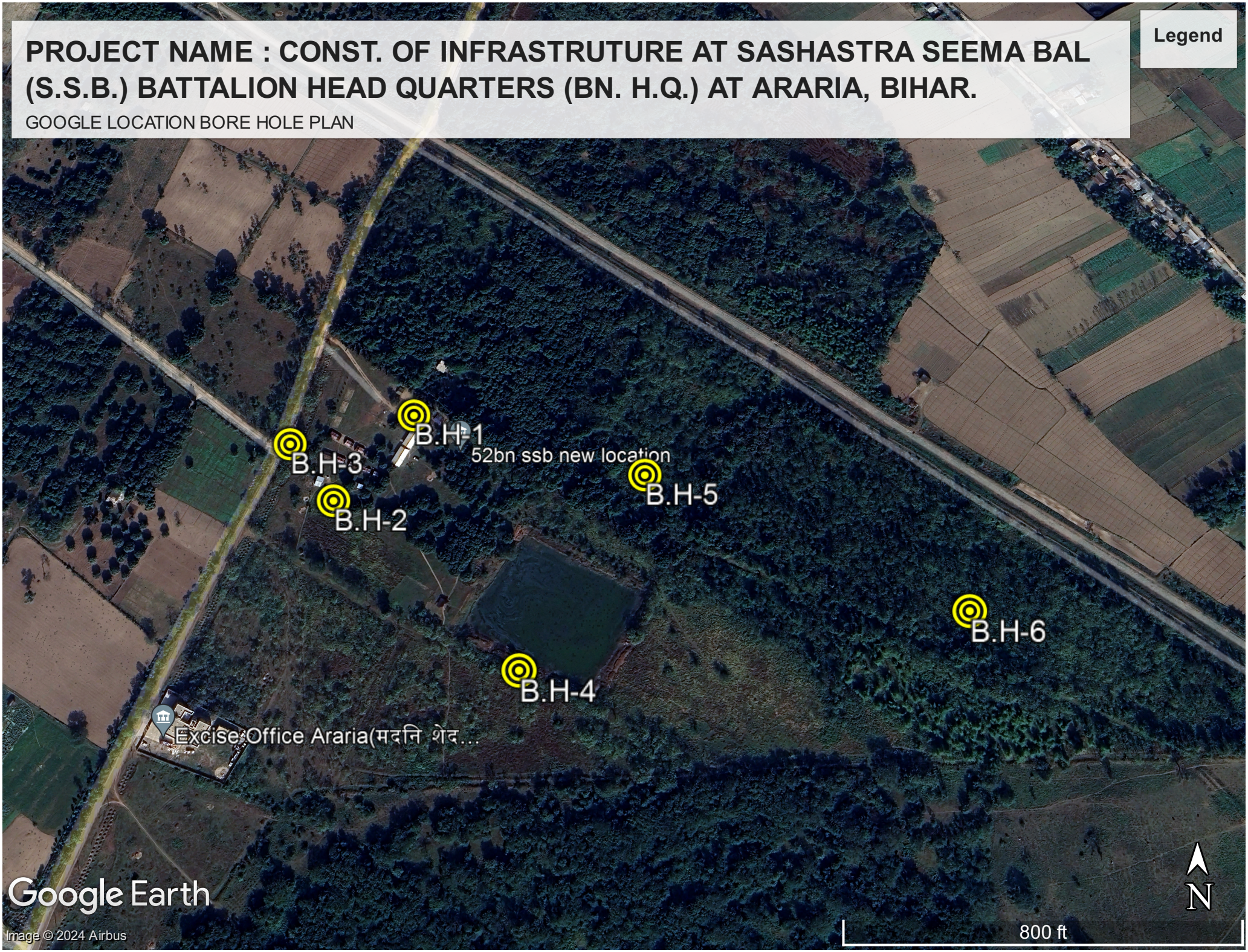
OWNER
DIRCTORATE GENERAL, SSB (Govt. of India, MHA)
East Block - V, R.K.Puram, New Delhi- 110066

PMC CONSULTANT
WAPCOS Ltd.
(A GOVERNMENT OF INDIA UNDERTAKING)
WAPCOS

DATE	SCALE	TITLE:
27.03.2024	NTS	**LAYOUT PLAN**
DEPT:	ARCH	
DRN BY:		
CHK BY:		
APP BY:		
JOB NO.		DOCUMENT ID
		REV. R0

PROJECT NAME : CONST. OF INFRASTRUTURE AT SASHASTRA SEEMA BAL (S.S.B.) BATTALION HEAD QUARTERS (BN. H.Q.) AT ARARIA, BIHAR.

GOOGLE LOCATION BORE HOLE PLAN



TENDER DOCUMENT FOR

Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I

NIT No. WAP/CMU-III/2025-26/SSB/Araria/12

Date: 04-08-2025

Volume-II
FINANCIAL PROPOSAL

WAPCOS LIMITED
CONSTRUCTION MANAGEMENT UNIT- III
1st Floor, NPCC, BUILDING, PLOT NO. 148,
SECTOR-44, GURUGRAM-122003, HARYANA

August 2025

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SECTION – X

FINANCIAL PROPOSAL

- **Letter of Transmittal for Financial Bid**
- **Total Cost of Works**
- **Terms of Payment**

Letter of Transmittal for Financial Bid

(On Original Letter Head of Bidder)

Dated:

To,
The Chief Engineer
Construction Management Unit-III
WAPCOS Limited, Gurugram

Sub: Financial Bid for the work ----- (Name of Work /Project)

Dear Sir,

With reference to this NIT document, I/we, having examined the Bidding Documents and understood their contents, hereby submit my/our Bid for the aforesaid Project. The Bid is unconditional and unqualified.

1. I / We acknowledge that the WAPCOS will be relying on the information provided in the BID and the documents accompanying the BID for selection of the Contractor for the aforesaid Project, and we certify that all information provided in the Bid are true and correct; nothing has been omitted which renders such information misleading; and all documents accompanying the BID are true copies of their respective originals.
2. The BID percentage rate / price has been quoted by me / us after taking into consideration all the terms and conditions stated in the NIT, format of Contract Agreement, our own estimates of costs and after a careful assessment of the site and all own the conditions that may affect the project cost and implementation of the project.
3. I/ We acknowledge the right of the Authority to reject our BID without assigning any reason or otherwise and hereby waive, to the fullest extent permitted by applicable law, our right to challenge the same on any account whatsoever.
4. In the event of my/ our being declared as the Selected Bidder, I/we agree to enter into a Agreement in accordance with the format of Contract Agreement. We agree not to seek any changes in the aforesaid format of Contract Agreement and agree to abide by the same.
5. I / We shall keep this offer valid as period specified in the NIT.
6. I / We hereby submit our FINANCIAL BID and offer Price excluding GST as filled in BoQ excel sheet “BoQ1” for undertaking the aforesaid Project in accordance with the Bidding Documents and the Agreement.

Yours faithfully,

Date: (Signature, name and designation of the Authorized signatory)

Place: **Name and seal of Bidder**

SUMMARY OF COST

Sl. No.	Description	Total Quoted Cost (Rs.)
1	Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I	**DO NOT FILL COST HERE**
	Total	
	Total amount in words: **DO NOT FILL COST HERE AS IT IS TECHNICAL PROPOSAL FILE**	

Note:-

- ***The Performa for filling the rate is given in Microsoft excel sheet. Bidder shall fill the rate only up to two decimal places in soft format. The bidder will upload same filled rate quote in soft Microsoft Excel copy during uploading of financial bid.***

- ***The Bidder shall quote rate up to two decimal only in bill of quantity of tender.***

- Prices quoted by the Bidder shall include all Materials, Tools & Plant, labour, supervision, profit; other levies together with all general risks, liabilities and obligations set out or implied in the contract, applicable Labour Cess, cost of insurance to this contract, all applicable tax liabilities like Income Tax & Surcharges, etc. Any other taxes /cess as per Government directives shall be deducted from each bill paid to the Contractor, from time to time. GST shall be payable extra as per prevailing rates.It is mandatory to bidders to deposit GST within time limit framed by Govt. of India, if applicable. The Goods and Services Tax (GST) shall be reimbursed to the Agency only after uploading of bills by Contractor on GST Portal to avail Input benefit of GST

- The Contractor shall issue Tax Invoices to the Employer showing (i) Basic amount (ii) GST amount separately in each bill. It is mandatory to bidders to deposit GST within time limit framed by Govt. of India, if applicable. The Goods and Services Tax (GST) shall be reimbursed to the Agency only after uploading of bills by Contractor on GST Portal “to avail Input benefit of GST”.

- The company shall be performing all its duties of deduction TDS and other deduction on payment made to the contractor as per applicable legislation in force on the date of submission of bid or to be newly / amended introduced during the execution of the Contract.

Terms of Payment

TERMS OF PAYMENT

Construction & Development of Infrastructure Works at Battalion Headquarters SSB, Araria, Bihar on EPC Mode-I

The Stage wise payments shall be made in Percentage of the Agreed Cost of works as quoted by the bidder/contractor. The “STAGE OF CONSTRUCTION” for each component shall be as per the details below. The Payment will be made after completion of particular “STAGE OF CONSTRUCTION” in all respect as per the detail in Section of Scope of Work in compliance of all the conditions mentioned in the Tender Document.

It is mandatory that contractor shall submit stage wise bills along with the Test Reports of the materials used in the works and the photographs of the complete stage of construction as well as periodically photographs taken during execution. The photographs shall be taken from the Digital camera showing the date and time on the photograph, nothing extra shall be payable to the agency on this account. The frequency of Test of materials will be as per the standard norms and conditions in tender document.

The works mentioned in column no. 2 of Stage of Construction, are milestone for progress of work and payment purpose only. The main scope of work for each component shall be governed as detailed in “SECTION: - SCOPE OF WORK” of the tender document and final payment shall be made accordingly to the Contractor.

If any works mentioned in column no. 2 of Stage of Construction do not execute or is executed partially due to any reason, then the payment will be deducted on pro-rata basis over % mentioned and in column no.3 for particular stage of construction.

The final 100% payment depicts the total cost of work as per the scope of work and in compliance with all conditions mentioned in tender document.

CONSTRUCTION & DEVELOPMENT OF INFRASTRUCTURE WORKS AT BATTALION HEADQUARTERS SSB, ARARIA, BIHAR ON EPC MODE-I

PAYMENT SCHEDULES

S.No.	DESCRIPTION	Percentage of Quoted Cost
1	Architectural and Structural Drawings	1.00%
2	Construction of Admin Block/Training Block and Offices (G+2)	19.00%
3	Construction of 01 No. 128 Men Barrack (G+2)	14.00%
4	Construction of Residential Quarters Type-II/36 Nos. (1 Block) (S+9)	22.00%
5	Construction of Residential Quarters Type-III /24 Nos. (1 Block) (S+6)	8.00%
6	Construction of Residential Quarters Type-IV /6 Nos.(1 Block) (S+3)	5.00%
7	Construction of Residential Quarters Type-V/2 Nos. (2 Blocks) (G)	3.00%
8	Construction of Boundary Wall, Gate and Guard Room	5.00%
9	Site Development Works	11.00%
10	Construction of Sewage Treatment Plant	2.00%
11	External Electrical Works	3.50%
12	Construction of Water Tank and Pump Room	1.00%
13	Issuance of NOCs by all relevant Local Bodies and GRIHA Certificate	1.50%
14	Handing over of the project with full satisfaction of Engineer in-charge and submission of completion certificate, provided by the Engineer-in-charge	4.00%
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 1		
ARCHITECTURAL AND STRUCTURAL DRAWINGS		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.0	**ARCHITECTURAL AND STRUCTURAL DRAWINGS**	
1.1	On submission & Approval of Geo-Technical and Topographical Survey Report	0.15%
1.2	On submission & Approval of Draft Layout Plans, Floor Plans and 3D Views of the Building (Soft and 3 Hard copies)	0.15%
1.3	On submission & Approval of Final Layout Plan of the Project (Soft and 4 Hard copies)	0.10%
1.4	On submission & Approval of Final Floor plans of Buildings, Detail Architectural Drawings including 3D view from each side, Sectional elevation etc. (Soft and 4 Hard copies)	0.15%
1.5	On submission & Approval of Detailed Civil, Electrical and plumbing work Specification of each component of the Building, External development & other works involved in the project. (Soft and 4 Hard copies)	0.10%
1.6	On registration of Project with GRIHA for 3 Star GRIHA Certification	0.10%
1.7	On submission & Approval of IIT vetted Final Structural design and drawings (Soft and 7 Hard copies)	0.10%
1.8	On Submission & Approval of as built drawings.	0.15%
	GRAND TOTAL	**1.00%**

PAYMENT SCHEDULE No. 2		
CONSTRUCTION OF ADMIN BLOCK/TRAINING BLOCK AND OFFICES		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.0	**CIVIL WORKS**	
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.50%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	5.00%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.50%
1.4	On casting of columns in Ground Floor & allied works of Building as per Scope of Work	2.00%
1.5	On casting of Ground Floor Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.6	On casting of columns in First Floor & allied works of Building as per Scope of Work	2.00%
1.7	On casting of First Floor Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.8	On casting of columns in Second Floor & allied works of Building as per Scope of Work	2.00%
1.9	On casting of Second Floor Roof Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.10	On casting of columns upto Mumty & parapet wall and allied works of Building as per Scope of Work	1.50%
1.11	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	1.00%
1.12	On completion brick work of Ground floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.13	On completion brick work of First floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.14	On completion brick work of Second floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.15	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.16	On completion of internal plastering of Ground floor of Building	3.00%
1.17	On completion of internal plastering of First floor of Building	3.00%
1.18	On completion of internal plastering of Second floor of Building	3.00%
1.19	On completion of External Plastering of Building including parapet wall	3.00%
1.20	On completion of flooring in staircase of Building	3.00%
1.21	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Ground floor of Building	3.00%
1.22	On completion of flooring in rooms, toilets, common area and wall tiles etc. in First floor of Building	3.00%
1.23	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Second floor of Building	3.00%

CONSTRUCTION OF ADMIN BLOCK/TRAINING BLOCK AND OFFICES		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.24	On fixing railing in staircases, balcony, corridors etc. of Building	2.50%
1.25	On providing and fixing door, window shutters, cupboard shutters, ventilators, hardware fixtures & fittings, etc. of Building	3.00%
1.26	On completion of Over- head Tanks in all Respect of Building	1.50%
1.27	Terrace water proofing & allied works & testing thereof of Building	1.50%
1.28	External finishing work of the building alongwith Plinth Protection of Building	3.00%
	Sub-Total (1)	**72.00%**
2.0	**ELECTRICAL WORKS**	
2.1	Internal Wiring complete in all respects	2.00%
2.2	Telephone Wiring and Conduits complete in all respects	1.00%
2.3	Light, Fans, exhaust fans and their Fixtures complete in all respects	3.00%
2.4	Earthing complete in all respects	2.00%
2.5	Lightning Protection System complete in all respects	2.00%
2.6	Safety Accessories complete in all respects	1.00%
2.7	Distribution Board (Ready Made MCB DB) complete in all respects	2.00%
	Sub-Total (2)	**13.00%**
3.0	**PHE WORKS**	
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	2.00%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	2.00%
	Sub-Total (3)	**4.00%**
4.0	**FIRE PROTECTION WORKS**	
4.1	On Completion of Fire Extinguishers Work	0.50%
4.2	On Completion of Fire Downcomer System with Piping System	1.50%
4.3	On Completion of Automatic Fire Alarm System	1.00%
	Sub-Total (4)	**3.00%**
5	**Finishing and Handing Over**	
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	4.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	4.00%
	Sub-Total (5)	**8.00%**
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 3		
CONSTRUCTION OF 01 NO. 128 MEN BARRACK		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.0	**CIVIL WORKS**	
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.50%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	5.00%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.50%
1.4	On casting of columns in Ground Floor & allied works of Building as per Scope of Work	2.00%
1.5	On casting of Ground Floor Roof Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.6	On casting of columns in First Floor & allied works of Building as per Scope of Work	2.00%
1.7	On casting of First Floor Roof Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.8	On casting of columns in Second Floor & allied works of Building as per Scope of Work	2.00%
1.9	On casting of Second Floor Roof Beams and Slab & allied works of Building as per Scope of Work	3.00%
1.10	On casting of columns upto Mumty & allied works of Building as per Scope of Work	2.00%
1.11	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.12	On completion brick work of Ground floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.13	On completion brick work of First floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.14	On completion brick work of Second floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.50%
1.15	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.16	On completion of internal plastering of Ground floor of Building	3.00%
1.17	On completion of internal plastering of First floor of Building	3.00%
1.18	On completion of internal plastering of Second floor of Building	3.00%
1.19	On completion of External Plastering of Building	3.00%
1.20	On completion of flooring in staircase of Building	3.00%
1.21	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Ground floor of Building	3.00%
1.22	On completion of flooring in rooms, toilets, common area and wall tiles etc. in First floor of Building	3.00%
1.23	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Second floor of Building	3.00%
1.24	On fixing railing in staircases, balcony, corridors etc. of Building	2.50%
1.25	On providing and fixing door, window shutters, cupboard shutters, ventilators, hardware fixtures & fittings, etc. of Building	3.00%
1.26	On completion of Over- head Tanks in all Respect of Building	1.50%

CONSTRUCTION OF 01 NO. 128 MEN BARRACK		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.27	Terrace water proofing & allied works & testing thereof of Building	1.50%
1.28	External finishing work of the building alongwith Plinth Protection of Building	3.00%
	Sub-Total (1)	**73.00%**
2.0	**ELECTRICAL WORKS**	
2.1	Internal Wiring complete in all respects	2.00%
2.2	Light, Fans, exhaust fans and their Fixtures complete in all respects	3.00%
2.3	Earthing complete in all respects	2.00%
2.4	Lightning Protection System complete in all respects	2.00%
2.5	Safety Accessories complete in all respects	2.00%
2.6	Distribution Board (Ready Made MCB DB) complete in all respects	2.00%
	Sub-Total (2)	**13.00%**
3.0	**PHE WORKS**	
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	1.50%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	1.50%
	Sub-Total (3)	**3.00%**
4.0	**FIRE PROTECTION WORKS**	
4.1	On Completion of Fire Extinguishers Work	0.50%
4.2	On Completion of Fire Downcomer System with Piping System	1.50%
4.3	On Completion of Automatic Fire Alarm System	1.00%
	Sub-Total (4)	**3.00%**
5	**Finishing and Handing Over**	
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	4.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	4.00%
	Sub-Total (5)	**8.00%**
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 4		
CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-II (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**CIVIL WORKS**	
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.00%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	2.50%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.00%
1.4	On casting of columns in Stilt Floor & allied works of Building as per Scope of Work	1.00%
1.5	On casting of Stilt Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.6	On casting of columns in First Floor & allied works of Building as per Scope of Work	1.00%
1.7	On casting of First Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.8	On casting of columns in Second Floor & allied works of Building as per Scope of Work	1.00%
1.9	On casting of Second Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.10	On casting of columns in Third Floor & allied works of Building as per Scope of Work	1.00%
1.11	On casting of Third Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.12	On casting of columns in Fourth Floor & allied works of Building as per Scope of Work	1.00%
1.13	On casting of Fourth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.12	On casting of columns in Fifth Floor & allied works of Building as per Scope of Work	1.00%
1.13	On casting of Fifth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.14	On casting of columns in Sixth Floor & allied works of Building as per Scope of Work	1.00%
1.15	On casting of Sixth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.14	On casting of columns in Seventh Floor & allied works of Building as per Scope of Work	1.00%
1.15	On casting of Seventh Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.16	On casting of columns in Eighth Floor & allied works of Building as per Scope of Work	1.00%
1.17	On casting of Eighth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.16	On casting of columns in Nineth Floor & allied works of Building as per Scope of Work	1.00%
1.17	On casting of Nineth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	1.50%
1.18	On casting of columns upto Mumty & allied works of Building as per Scope of Work	0.50%

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-II (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.19	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	0.50%
1.20	On completion brick work of Stilt floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.21	On completion brick work of First floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.22	On completion brick work of Second floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.23	On completion brick work of Third floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.24	On completion brick work of Fourth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.25	On completion brick work of Fifth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.26	On completion brick work of Sixth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.27	On completion brick work of Seventh floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.28	On completion brick work of Eighth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.29	On completion brick work of Nineth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.30	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	0.50%
1.31	On completion of internal plastering of Stilt floor of Building	0.50%
1.32	On completion of internal plastering of First floor of Building	1.00%
1.33	On completion of internal plastering of Second floor of Building	1.00%
1.34	On completion of internal plastering of Third floor of Building	1.00%
1.35	On completion of internal plastering of Fourth floor of Building	1.00%
1.36	On completion of internal plastering of Fifth floor of Building	1.00%
1.37	On completion of internal plastering of Sixth floor of Building	1.00%
1.38	On completion of internal plastering of Seventh floor of Building	1.00%
1.39	On completion of internal plastering of Eighth floor of Building	1.00%
1.40	On completion of internal plastering of Nineth floor of Building	1.00%
1.41	On completion of External Plastering of Building	1.00%
1.42	On completion of flooring in staircase of Building	1.00%
1.43	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Stilt floor of Building	1.00%

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-II (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.44	On completion of flooring in rooms, toilets, common area and wall tiles etc. in First floor of Building	1.50%
1.45	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Second floor of Building	1.50%
1.46	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Third floor of Building	1.50%
1.47	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Fourth floor of Building	1.50%
1.48	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Fifth floor of Building	1.50%
1.49	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Sixth floor of Building	1.50%
1.50	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Seventh floor of Building	1.50%
1.51	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Eighth floor of Building	1.50%
1.52	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Nineth floor of Building	1.50%
1.53	On fixing railing in staircases, balcony, corridors etc. of Building	1.50%
1.54	On providing and fixing door, window shutters, cupboard shutters, ventilators, hardware fixtures & fittings, etc. of Building	1.50%
1.55	On completion of Over- head Tanks in all Respect of Building	0.50%
1.56	Terrace water proofing & allied works & testing thereof of Building	0.50%
1.57	External finishing work of the building alongwith Plinth Protection of Building	2.00%
	Sub-Total (1)	**75.00%**

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-II (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
2	**ELECTRICAL WORKS**	
2.1	Internal Wiring complete in all respects	1.50%
2.2	Light, Fans, exhaust fans etc and their Fixtures complete in all respects	2.50%
2.3	Earthing and Lightening Protection complete in all respects	1.00%
2.4	Safety Accessories complete in all respects	1.00%
2.5	Distribution Board with Meter Panel complete in all respects	2.00%
2.6	Installation, Testing and Commissioning of Lift (2 Nos)	4.00%
	Sub-Total (2)	**12.00%**
3	**PHE WORKS**	
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	1.50%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	1.50%
	Sub-Total (3)	**3.00%**
4	**FIRE PROTECTION WORKS**	
4.1	On Completion of Fire Extinguishers Work	1.00%
4.2	On Completion of Fire Downcomer System with Piping System	3.00%
	Sub-Total (4)	**4.00%**
5	**Finishing and Handing Over**	
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	3.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	3.00%
	Sub-Total (5)	**6.00%**
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 5		
CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-III (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**CIVIL WORKS**	
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.50%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	4.00%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.50%
1.4	On casting of columns in Stilt Floor & allied works of Building as per Scope of Work	1.00%
1.5	On casting of Stilt Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.6	On casting of columns in Ground Floor & allied works of Building as per Scope of Work	1.00%
1.7	On casting of Ground Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.8	On casting of columns in First Floor & allied works of Building as per Scope of Work	1.00%
1.9	On casting of First Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.10	On casting of columns in Second Floor & allied works of Building as per Scope of Work	1.00%
1.11	On casting of Second Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.12	On casting of columns in Third Floor & allied works of Building as per Scope of Work	1.00%
1.13	On casting of Third Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.12	On casting of columns in Fourth Floor & allied works of Building as per Scope of Work	1.00%
1.13	On casting of Fourth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.14	On casting of columns in Fifth Floor & allied works of Building as per Scope of Work	1.00%
1.15	On casting of Fifth Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.14	On casting of columns upto Mumty & allied works of Building as per Scope of Work	0.50%
1.15	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	1.00%
1.16	On completion brick work of Stilt floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.17	On completion brick work of Ground floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.16	On completion brick work of First floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-III (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.17	On completion brick work of Second floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.18	On completion brick work of Third floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.19	On completion brick work of Fourth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.20	On completion brick work of Fifth floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%
1.21	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.22	On completion of internal plastering of Stilt floor of Building	1.50%
1.23	On completion of internal plastering of Ground floor of Building	1.50%
1.24	On completion of internal plastering of First floor of Building	1.50%
1.25	On completion of internal plastering of Second floor of Building	1.50%
1.26	On completion of internal plastering of Third floor of Building	1.50%
1.27	On completion of internal plastering of Fourth floor of Building	1.50%
1.28	On completion of internal plastering of Fifth floor of Building	1.50%
1.29	On completion of External Plastering of Building	1.50%
1.30	On completion of flooring in staircase of Building	1.50%
1.31	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Stilt floor of Building	1.50%
1.32	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Ground floor of Building	1.50%
1.33	On completion of flooring in rooms, toilets, common area and wall tiles etc. in First floor of Building	1.50%
1.34	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Second floor of Building	1.50%
1.35	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Third floor of Building	1.50%
1.36	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Fourth floor of Building	1.50%
1.37	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Fifth floor of Building	1.50%
1.38	On fixing railing in staircases, balcony, corridors etc. of Building	1.50%
1.39	On providing and fixing door, window shutters, ventilators, hardware fixtures & fittings, etc. of Building	1.50%
1.40	On completion of Over- head Tanks in all Respect of Building	0.50%
1.41	Terrace water proofing & allied works & testing thereof of Building	0.50%
1.42	External finishing work of the building alongwith Plinth Protection of Building	3.00%
	Sub-Total (1)	**74.00%**
2	**ELECTRICAL WORKS**	
2.1	Internal Wiring complete in all respects	2.00%

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-III (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
2.2	Light, Fans, exhaust fans etc and their Fixtures complete in all respects	2.50%
2.3	Earthing and Lightening Protection complete in all respects	1.00%
2.4	Safety Accessories complete in all respects	1.50%
2.5	Distribution Board with Meter Panel complete in all respects	2.00%
2.6	Installation, Testing and Commissioning of Lift (2 Nos)	4.00%
	Sub-Total (2)	**13.00%**
3	**PHE WORKS**	
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	1.50%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	1.50%
	Sub-Total (3)	**3.00%**
4	**FIRE PROTECTION WORKS**	
4.1	On Completion of Fire Extinguishers Work	1.00%
4.2	On Completion of Fire Downcomer System with Piping System	3.00%
	Sub-Total (4)	**4.00%**
5	**Finishing and Handing Over**	
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	3.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	3.00%
	Sub-Total (5)	**6.00%**
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 6		
CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-IV (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**CIVIL WORKS**	
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.50%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	5.00%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.50%
1.4	On casting of columns in Stilt Floor & allied works of Building as per Scope of Work	1.50%
1.5	On casting of Stilt Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.50%
1.6	On casting of columns in First Floor & allied works of Building as per Scope of Work	1.50%
1.7	On casting of First Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.50%
1.8	On casting of columns in Second Floor & allied works of Building as per Scope of Work	1.50%
1.9	On casting of Second Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.50%
1.10	On casting of columns in Third Floor & allied works of Building as per Scope of Work	1.50%
1.11	On casting of Third Floor Roof Beams and Slab & allied works of Building as per Scope of Work	2.50%
1.12	On casting of columns upto Mumty & allied works of Building as per Scope of Work	1.00%
1.13	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	2.00%
1.14	On completion brick work of Stilt floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.00%
1.15	On completion brick work of First floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.00%
1.16	On completion brick work of Second floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.00%
1.17	On completion brick work of Third floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	2.00%
1.18	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%
1.19	On completion of internal plastering of Stilt floor of Building	2.50%
1.20	On completion of internal plastering of First floor of Building	2.50%
1.21	On completion of internal plastering of Second floor of Building	2.50%
1.22	On completion of internal plastering of Third floor of Building	2.50%
1.23	On completion of External Plastering of Building	2.50%
1.24	On completion of flooring in staircase of Building	2.50%
1.25	On completion of flooring in Stilt floor of Building	3.00%

CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-IV (1 BLOCK)		
S.No.	**Stages of Construction**	**Percentage Breakup**
1.26	On completion of flooring in rooms, toilets, common area and wall tiles etc. in First floor of Building	3.00%
1.27	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Second floor of Building	3.00%
1.28	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Third floor of Building	3.00%
1.29	On fixing railing in staircases, balcony, corridors etc. of Building	2.50%
1.30	On providing and fixing door, window shutters, ventilators, hardware fixtures & fittings, etc. of Building	2.50%
1.31	On completion of Over- head Tanks in all Respect of Building	1.50%
1.32	Terrace water proofing & allied works & testing thereof of Building	1.50%
1.33	External finishing work of the building alongwith Plinth Protection of Building	3.00%
	Sub-Total (1)	**76.00%**
2	**ELECTRICAL WORKS**	
2.1	Internal Wiring complete in all respects	2.00%
2.2	Light, Fans, exhaust fans etc and their Fixtures complete in all respects	3.00%
2.3	Earthing and Lightening Protection complete in all respects	2.00%
2.4	Safety Accessories complete in all respects	2.00%
2.5	Distribution Board with Meter Panel complete in all respects	2.00%
	Sub-Total (2)	**11.00%**
3	**PHE WORKS**	
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	1.50%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	1.50%
	Sub-Total (3)	**3.00%**
4	**FIRE PROTECTION WORKS**	
4.1	On Completion of Fire Extinguishers Work	1.00%
4.2	On Completion of Fire Downcomer System with Piping System	3.00%
	Sub-Total (4)	**4.00%**
5	**Finishing and Handing Over**	
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	3.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	3.00%
	Sub-Total (5)	**6.00%**
	GRAND TOTAL	**100.00%**

PAYMENT SCHEDULE No. 7				
CONSTRUCTION OF RESIDENTIAL QUARTERS TYPE-V (2 BLOCK)				
S.No.	**Stages of Construction**	**TOWER-1**	**TOWER-2**	**Percentage Breakup**
1	**CIVIL WORKS**			
1.1	On Completion of Site Clearance / Jungle Clearance, Filling and levelling of site as per Scope of Work	2.50%	2.50%	5.00%
1.2	On Completion of RCC Piles, RCC Pile Cap and Pile Load Test as per Scope of Work	5.00%	5.00%	10.00%
1.3	On completion of all works upto Plinth level as per Scope of Work	2.50%	2.50%	5.00%
1.4	On casting of columns in Ground Floor & allied works of Building as per Scope of Work	2.50%	2.50%	5.00%
1.5	On casting of Ground Floor Roof Beams and Slab & allied works of Building as per Scope of Work	5.00%	5.00%	10.00%
1.6	On casting of columns upto Mumty & allied works of Building as per Scope of Work	1.50%	1.50%	3.00%
1.7	On casting of Mumty Roof Beams and Slab & allied works of Building as per Scope of Work	2.50%	2.50%	5.00%
1.8	On completion brick work of Ground floor along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.50%	1.50%	3.00%
1.9	On completion brick work in parapet walls and Mumpty along with provision of lintel etc. and providing and fixing door & window frames & allied works of Building as per Scope of Work	1.00%	1.00%	2.00%
1.10	On completion of internal plastering of Ground floor of Building	2.00%	2.00%	4.00%
1.11	On completion of External Plastering of Building	2.00%	2.00%	4.00%
1.12	On completion of flooring in staircase of Building	2.00%	2.00%	4.00%
1.13	On completion of flooring in rooms, toilets, common area and wall tiles etc. in Ground floor of Building	2.00%	2.00%	4.00%
1.14	On fixing railing in staircases, balcony, corridors etc. of Building	1.50%	1.50%	3.00%
1.15	On providing and fixing door, window shutters, ventilators, hardware fixtures & fittings, etc. of Building	1.50%	1.50%	3.00%
1.16	On completion of Over- head Tanks in all Respect of Building	1.00%	1.00%	2.00%
1.17	Terrace water proofing & allied works & testing thereof of Building	1.00%	1.00%	2.00%
1.18	External finishing work of the building alongwith Plinth Protection of Building	1.50%	1.50%	3.00%
	Sub-Total (1)	**38.50%**	**38.50%**	**77.00%**
2	**ELECTRICAL WORKS**			
2.1	Internal Wiring complete in all respects	1.00%	1.00%	2.00%
2.2	Light, Fans, exhaust fans etc and their Fixtures complete in all respects	1.50%	1.50%	3.00%
2.3	Earthing and Lightening Protection complete in all respects	1.00%	1.00%	2.00%
2.4	Safety Accessories complete in all respects	1.00%	1.00%	2.00%
2.5	Distribution Board with Meter Panel complete in all respects	1.00%	1.00%	2.00%
	Sub-Total (2)	**5.50%**	**5.50%**	**11.00%**
3	**PHE WORKS**			
3.1	On providing and laying of pipes for internal/external sanitary, Waste, etc. in position of all floors of Building	0.75%	0.75%	1.50%
3.2	On Supply and installation of all plumbing and sanitary fittings in the Building of Building	0.75%	0.75%	1.50%
	Sub-Total (3)	**1.50%**	**1.50%**	**3.00%**
4	**FIRE PROTECTION WORKS**			
4.1	On Completion of Fire Extinguishers Work	0.25%	0.25%	0.50%
4.2	On Completion of Fire Downcomer System with Piping System	1.25%	1.25%	2.50%
	Sub-Total (4)	**1.50%**	**1.50%**	**3.00%**
5	**Finishing and Handing Over**			
5.1	Final coat of internal/external painting, polishing on each required surface, testing / commissioning of services prior to handing over of Building	1.50%	1.50%	3.00%
5.2	Final fixing of all complete sanitary fitting, lighting, fans, final fixtures, and other fittings etc. as detailed in scope of work prior to handing over of Building	1.50%	1.50%	3.00%
	Sub-Total (5)	**3.00%**	**3.00%**	**6.00%**
	GRAND TOTAL	**50.00%**	**50.00%**	**100.00%**

PAYMENT SCHEDULE No. 8		
CONSTRUCTION OF BOUNDARY WALL, GATE AND GUARD ROOM		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**BOUNDARY WALL**	
1.1	On Completion of work upto Plinth Level	10%
1.2	On Completion of Columns	10%
1.3	On Completion of Brickwork	10%
1.4	On Completion of Top Beams	10%
1.5	On Completion of Plaster of Inner face of Boundary wall	10%
1.6	On Completion of Plaster of Outer face of Boundary wall	10%
1.7	On Completion of Concertina Wire Fencing	5%
1.8	On Completion of Painting of Inner face of Boundary wall	5%
1.9	On Completion of Painting of Outer face of Boundary wall	5%
	Sub-Total (1)	**75%**
2	**Gate (As per LoP)**	**20%**
3	**Guard Room**	**5%**
	GRAND TOTAL	**100.00%**
Note: The Successful bidder shall submit the Payment Schedule for the Gate and Guard Room upon award of work for appproval		

PAYMENT SCHEDULE No. 9		
SITE DEVELOPMENT WORKS		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**On completion of external development works like raising of site, road, Water Supply, Sewerage network, , footpath, Storm water drains, Rain water Harvesting other necessary allied development works.**	
1.1	Raising of Ground level for Roads and Buildings (Levelling)	40.00%
1.2	Cement Concrete Pavement with Vacuum Dewatered Concrete	19.00%
1.3	Footpath with PCC Base, 60 mm thick Paver blocks and Kerb stone edging	1.00%
1.4	External Sewerage Network	7.00%
1.5	Water Supply Network	4.00%
1.6	Storm Water Drains Network	20.00%
1.7	Rain Water Harvesting	3.00%
1.8	External Service Connections	6.00%
	GRAND TOTAL	**100.00%**
Note: The Successful bidder shall submit the Payment Schedule for the above works upon award of work for appproval		

PAYMENT SCHEDULE No. 10		
CONSTRUCTION OF SEWAGE TREATMENT PLANT		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**SEWAGE TREATMENT PLANT AND PLANT ROOM**	
1.1	Design, Supply, Installation, testing and Commissioning of STP of appropriate Technology inlcuding Civil works (excluding Plant room), tertiary treatment etc. for the Campus - 150 KLD Capacity	87.00%
1.2	On completion of Plant Room for STP as per Scope of Work	13.00%
	GRAND TOTAL	**100.00%**
Note: The Successful bidder shall submit the Payment Schedule for the above works upon award of work for appproval		

PAYMENT SCHEDULE No. 11		
EXTERNAL ELECTRICAL WORKS		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**External Electrical Works**	
1.1	Supplying, installation, testing and commissioning of 33 kV/0.433 kV or 11 kV/0.433 kV substation equipment comprising HT panel, dry type/Oil type transformers, HT cable, bus trunking from transformer to LT panel, LT panels, automatic power factor correction panel, active harmonic filters, TVSS (transient voltage suppression system), SPD (surge protection system), essential panel, earthing, required inter-connections, substation safety equipments including LT cabling from substation to the buildings fed by the substation. - 500 kVA Capacity	24.00%
1.2	Supplying, installation, testing and commissioning of DG sets, AMF panel, bus ducting/ cables from DG sets to essential panel, DG set enclosure room sound insulation/ventilation/smoke exhaust as required, earthing of DG set system, control cabling, fuel tank/piping, DG set exhaust piping/ exhaust chimney as per CPCB norms, civil works connected with DG sets including foundation as required - Capacity 300 kVA	14.00%
1.3	Supplying, Installation, Testing and Commissioning of VRV/VRF System including indoor / outdoor units, piping, electrical power distribuiton / wiring electrical panel, treated fresh air system etc. - Capacity 50 HP	10.50%
1.4	Supplying, Installation, Testing and Commissioning of LED Street Light for the Campus with the provision of Solar Lights in aletrnate Street Light	2.50%
1.5	Supplying, Installation, Testing and Commissioning of grid interactive roof top solar photo voltaic power generation system including space frame -Capacity 60 kWp	13.00%
1.6	Supplying, Installation, Testing and Commissioning of IP based CCTV system for building security comprising of PTZ/ fixed camera, cabling, digital recording, HD display system with minimum display of 5" x 8" per camera and hardware software support - To cover the area of 8000 sqm (approx).	6.00%
1.7	Electromechanical boom barrier with all accessories at Main Entry and Exit gate - 2 Nos.	1.00%
1.8	On Completion of Sub-Station Building with all allied works	29.00%
	GRAND TOTAL	**100.00%**
Note: The Successful bidder shall submit the Payment Schedule for the above works upon award of		

PAYMENT SCHEDULE No. 12		
CONSTRUCTION OF WATER TANK AND PUMP ROOM		
S.No.	**Stages of Construction**	**Percentage Breakup**
1	**WATER TANK AND PUMP ROOM**	
1.1	On Completion of 2 Nos. Tube Wells and Installation of Pumps with panels etc. complete in all respect	41.00%
1.2	On Completion of Underground Sump of 100 KL Capacity	37.00%
1.2	On completion of Pump Room as per Scope of Work	22.00%
	GRAND TOTAL	**100.00%**
Note: The Successful bidder shall submit the Payment Schedule for the above works upon award of work for appproval		