

NIT NO	HYD/2024-25/53
DATE	08.04.2025



**PROPOSED CIVIL WORKS REPAIR & RECARPETING OF EXISTING
BITUMEN ROAD AT LHO CAMPUS, BANK STREET KOTI HYDERABAD**

**Civil Contractors who are on the panel of SBI, Hyderabad Circle, (LHO) in the
Appropriate category are only eligible
(Contractors should submit proof of the same)**

Last date for submission of E Tender: 11.04.2025 @ 3.00 P.M.

Opening of Tenders: 11.04.2025 @ 3.30 P.M.

**The Asst. General Manager (P&E),
Premises & Estate Dept. LHO-Hyderabad
Ground Floor, SBI LHO Campus,
Bank Street, Koti,
Hyderabad – 500 095
Telangana
040-23466346/40**

NOTICE INVITING TENDER (NIT)

1.	Name of the work	Tender Notice for Proposed Civil works Repair and Recarpeting of Bituminous road at LHO Campus, Bank Street Koti, Hyderabad
2.	Estimated cost	Rs.12,94,875/- + plus GST
3.	Quantum of Earnest Money Deposit (EMD)	Rs.13,000/- Drafts/BCs shall be in favour of “ Assistant General Manager , Premises & Estate Dept Hyderabad ” Payable at Hyderabad.
4.	Date and Time where tender forms are available	From 09.04.2025 Up to 11.04.2025 at www.sbi.co.in/procurementnews
5.	Last date and time of submission of online Tender	11.04.2025 Up to 03:00PM
6.	Place, date & time for submission of e tender Contact person /telephone no/email address.	a) Submission up to 11.04.2025 Up to 03:00PM b) EMD submission Address: The Assistant General Manager (P&E), Premises & Estate Dept. LHO-Hyderabad, Ground Floor , SBI LHO Campus, Bank Street, Koti, Hyderabad – 500 095, Telangana
7.	Date, Time and Place of opening of e-Tenders	11.04.2025 Up to 03:30PM The Assistant General Manager (P&E), Premises & Estate Dept. LHO-Hyderabad, Ground Floor , SBI LHO Campus, Bank Street, Koti, Hyderabad – 500 095, Telangana
8.	Quantum of Security Deposit (percentage)	1. Initial Security Deposit (ISD) – 2% of the Tender value including EMD 2. Retention Money- 5 % of the running bills and Total deduction of 5% of value of work including EMD, ISD.
9.	Terms of payment of Bills, if any (specify the minimum value of work for payment of running account bills)	Running Bill of Minimum Value Rs. 6 Lakhs
10.	Stipulated time for completion of the Work/supply.	7 Days from the date of the work order issued to the contractor
11.	(Penalty clause) Liquidated Damages	@ 0.5% of the value of work per week of delay subject to a maximum penalty of 5% of the value of work would be strictly imposed.
12.	Validity period of the tender.	Three (3) Months
13.	Defect Liability Period.	Twelve (12) Months

14.	Eligible Taxes	A) Income Tax will be deducted at source as per Govt. Guidelines. B) Reimbursement of GST will be made only on submission of proper GST invoice as per applicable GST provision. The contractor should comply with the following; 1. Contractor should have GST Registration Number 2. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision 3. In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment 4. Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the credit of GST paid to the contractor 5. The GST Number of State Bank of India are For Telangana State -36AAACS8577K1ZQ
15.	Electronic Payment	Payment shall be made by way of Electronic fund transfer and the bill will be paid by the LHO Hyderabad. Firm should furnish details of the bank, a/c no, IFSC code
16.	Any additional Information	The quoted rate should be inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes (excluding GST), wastages, Octroi, machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work

The Asst. General Manager (P&E)
LHO Hyderabad

INSTRUCTIONS TO TENDERERS

1. Tenders are invited in online single bid for Proposed Civil works for Repair and Recarpeting of Bituminous road at LHO Campus, Bank Street , Koti Hyderabad.
2. Tenders should be submitted at Ass
3. The Assistant General Manager (P&E), Premises & Estate Dept. LHO- Hyderabad, SBI LHO, Bank Street, Koti, Hyderabad. declaration given in the tender to be signed with seal and scanned proof of dealership/empanelment letter Certificate should be submitted
4. Contract documents consist of detailed plans, technical specification, schedule of quantities of the various classes of work to be done, and the set of 'conditions of contract' to be compiled with by the person whose tender may be accepted.
5. **EMD amount** is to be deposited in the form of Demand Draft/ Banker's Cheque payable at Hyderabad and drawn in favor of Assistant General Manager (P&E), **SBI LHO Hyderabad**; otherwise the tender is liable for rejection.
6. Retention Money: From each running bill, an amount at the rate of 3% of the gross value of the running bill shall be recovered as retention money, till the total retention amount including the EMD and ISD amounts already with the Bank become 5% of the value of the contract amount. This amount is called as Total Security Deposit, which consists of three components
 - a) EMD - Earnest Money Deposit. **(Rs.13,000/-)**
 - b) ISD - Initial Security Deposits. **(2%)**
 - c) RM - Retention Money. **@ 5% of value of work**

The total security deposit will be kept with the Bank. And total security deposit may be refunded after the end of defects liability period **(one year)**, provided he has satisfactorily carried out all the works and attended to rectification of all defects in accordance with the conditions of the contract. In case of failure on the part to do so, the cost of rectifying the defects through any other agency shall be deducted from the amount of security deposit due to the contractor.

7. Completion of work:
 - i) The work shall be considered as complete only when the certificate of virtual completion is issued by the Bank.

- ii) The 'defects liability period' as prescribed in the contract shall commence only from date of such virtual completion.
 - iii) Any defect that may appear within the defects liability period shall be rectified by the contractor within reasonable time on receipt of necessary instructions from Bank to that effect.
8. The acceptance of a tender will rest with the Competent Authority, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all the Percentage rate tenders received, without assigning any reasons. All tenders in which any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be rejected.
 9. All compensation or other sums of money payable by the Contractor to Clients under the terms of this contract may be deducted from the security deposit, or from any sum that may be or may become due to the Contractor on any account whatsoever and in the event of the Security Deposit being reduced by reasons of any such deductions, the Contractor shall within 7 days of being asked to do make good in by DD any sum which have been deducted from his security deposit.
 10. Tender containing any condition leading to unknown / indefinite liability, are liable to be summarily rejected.
 11. Canvassing in connection with tenders is strictly prohibited and the Percentage rate tenders submitted by the contractors who resort to canvassing will be liable to rejection.
 12. The tenderer should quote their (own) rates for undertaking the work.
 13. GST as applicable will be reimbursed by Bank as specified in NIT.
 14. All taxes other than GST, other statutory obligation in respect of this contract, as applicable, shall be payable by contractor including transportation and TA / DA of the workers at site and the Bank will not entertain any claim whatsoever in this respect
 15. I.T. will be recovered as per Government Rules
 16. Time is the essence of the contract. The work should be completed on time as mentioned in the NIT. The successful Contractor will have to give CPM/PERT

chart of various activities of works to be done so that the work gets completed within the stipulated time. The chart shall be submitted within 7 days from the date of acceptance of the tender.

17. Tenders for works shall remain open for acceptance for a period of 90 days from the last date of tenders. If the tenderer withdraws his tender before the expiry of the said period or makes any modifications in terms and condition of the tender which are not acceptable to the Bank, then the bank without prejudice to any other right or remedy is at liberty to forfeit the earnest money.
18. The successful tenderer, after the work is awarded, he will have to enter into an agreement with the competent authority of the bank.
19. The tenderer must co-ordinate with the other agencies such as Interior/Civil/ Electrical/IT/Fire/ AC etc.
20. The tenderer should visit the site to ascertain the working conditions and local authority regulations / restrictions if any and other information required for the proper execution of the work.
21. The work may be carried out on any floor level as per site condition. Please note that materials and machines are required to be carried on head load and the same must be accounted in the costing. Please note that no separate cost shall be allowed for head load.
22. The quantities of various items given in the schedule of quantities are approximate. The quantities of work may vary at time of allotment / execution of work. Bank reserves the right to omit / delete any item(s) of work from the schedule at the time of allotment / before. Contractor will be paid for the actual work done at the site duly verified by the concerned official of the bank.
23. The unit price shall be deemed to be fixed price. In case of extra items, a record of labour charges paid shall be maintained and shall be presented regularly to the Employer's for checking. The settlement will be made based on figures arrived at jointly and taking unit price given in the contract assigned to the successful Tenderer. In case of extra items where similar or comparable items are quoted in the tender, extra rates shall be based on tender rates.
24. If the rate quoted by the contractor for any item / items are not workable or abnormally lower than the market rate, the bank may demand Bank guarantee

from the contractor for satisfactory completion of these work. The bank guarantee amount will be not less than 50% of the estimated amount of the items for which the rates are not workable or abnormally low. This bank guarantee will be released after completion of these works (unworkable and abnormally low rated items) to the satisfaction of the bank.

25. The contractor shall submit the bar chart/ CPM/ PERT as well as shall submit the insurance cover for the work in the form of CAR policy and Third-Party Insurance within seven (7) days from the acceptance of work order.
26. The work must be started within immediately from the date of receipt of work order/ mark out at site; whichever is later. In case of work not being started within this stipulated period, the bank reserves the right to cancel the work order duly forfeiting the Earnest money deposit
27. No employee of the Bank is allowed to work as a contractor for a period of 2 years of his/her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employees is any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.
28. Contractor should get approval of the samples of materials in advance with Bank's Engineer before use of the same in the work'
29. Bank has the right to offer the contractor to modify the old material wherever/ whenever necessary instead of new supplies
30. The quoted rate should be inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes(excluding GST), wastages, Octroi, machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work
31. The Percentage rate tenders shall summarily have rejected, if any one of the above said requirements has not been complied with.
32. The Bank will not be bound to accept the lowest tender and reserves the right to accept or reject any or all the Percentage rate tenders without assigning any reason whatsoever

33. The contractor should fulfill the labour regulation guidelines stipulated by the governments
34. No advance payment in any form will be granted for the works proposed
35. Period of taking up the final bill will be one month from/ after satisfactory virtual completion or the date of submission of the final bill whichever is later.
36. Contractor is advised **not to engage child labour during the contract period**
37. The SBI reserves the right to cancel or postpone the Percentage rate tenders at any stage without assigning any reason.
38. Firm should be visit the website till last date of submission for changes/ corrigendum if any
39. Tender documents found partly or fully modified / altered/ corrected etc shall stand summarily rejected
40. The make of materials should be chosen strictly from the approved makes as given in the tender. Using of the multi brands is not permissible. Single brand should be used for entire project.
- 41. ANY CLARIFICATIONS SOUGHT AFTER OPENING OF THE TENDERS WILL NOT BE ENTERTAINED AT ANY COST.**

The Assistant General Manager (P&E)
LHO, Hyderabad

GENERAL NOTES

1. PROCEDURE OF FILLING AND SUBMISSION OF TENDER

- a) Submission of BIDs/Tender Documents: Tenders should be submitted offline. The Assistant General Manager (P&E), Premises & Estate Dept. LHO- Hyderabad, SBI LHO, Bank Street, Koti, Hyderabad. declaration given in the tender to be signed with seal and scanned proof of dealership/empanelment letter Certificate should be submitted.
- b) In the event of the tender being submitted by a firm, it must be signed by a member or members of the firm having legal authority to do so, and if called for, the legal documents in support thereof must be produced for inspection and the same in the case of the firm carried out by one member of a joint family. It must disclose that the firm is duly registered under the India Partnership Act. Any tender signed by a member not holding a power of attorney shall be treated as invalid.
- c) Tenderer shall note that their tenders shall remain open for acceptance for a minimum period of three months from the last date of receipt of tenders. The tenders must be unconditional. Conditional tenders may be summarily rejected.

2. RATES TO INCLUDE:

While quoting their rates the tenderer should include the following if otherwise not stated herein before.

- a) Necessary cost of taking samples of materials supplied by them for the work. testing of the same at Govt.'s / approved laboratory including transportation, cost of the samples, as and when required.
- b) Submission of test reports of other materials as may be specified by Bank's Engineer.

3. STORAGE OF MATERIALS:

The contractor shall not store their materials and debris within the premises other than the work site handed over to him.

5. LABOUR HUTMENT:

Shelter or stay and other amenities for the labors have to be arranged by the contractor at his own expense and responsibility (outside the Bank premises).

6. IDLE LABOUR:

In case the work is held up for any site conditions not attributable to the contractors or for any decisions instructions / want of details from Employer or for any of the conditions, the contractor shall be allowed reasonable extension of time by the employer but any claim for idle labour shall not be entertained by the employer. Contractor's quoted rates should include for all such contingencies.

7. The contractor shall engage one competent person at site who shall take the instructions from the Employer. The work should not suffer due to lack of supervision, manpower and materials.
8. The Contractor is required to co-ordinate his works along with other agencies working at site. He has to reimburse any of the damage made by him or any of his representatives for any of the other agency or owner at site.
9. Making of any cut-out / opening for electrical wiring / fitting in any of false ceiling, partition, Paneling, masonry work etc., and providing panels of the same finish in partitions, paneling shall not be paid extra.
10. The contractor is required to fabricate a sample where required, or any item so installed for approval. Any changes made by the Employer, in the sample to the specifications as mentioned in the tender, shall not be deducted or paid extra.
11. All measurements given in the schedule hereunder are for the purpose of tender only. Payment will be made on actual measurement of the work done
12. All measurements shall be as per relevant I.S. standards

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TENDER FORM

PROJECT: PROPOSED CIVIL WORKS REPAIR & RECARPETING OF EXISTING BITUMEN ROAD AT LHO CAMPUS, BANK STREET KOTI HYDERABAD

REF : ROAD WORKS (REPAIR & RECARPETING EXISTING ROADS)

Dear Sirs,

I/We the undersigned have carefully gone through and clearly understood after visiting the site and the Tender drawings and tender documents comprising of the tender form, Notice to contractors, and conditions for building contract, Special Conditions, Specifications and Schedule of Probable quantities and Draft Agreement prepared by the Bank.

I/We do hereby undertake to execute and complete the whole or part of the work (as desired by you) at the respective rates which/I/We have quoted for the respective items of the Probable Bill of Quantities and at which rate the items specified amount to Rs. 30,36,504/.

In the event of this Tender being accepted I/We agree to enter into an agreement as and when required and execute the contract according to your form of Agreement, within a month of receipt of work order, in default thereof, I/We do hereby bind my-self/ourselves to forfeit the aforesaid initial security deposit.

I/We further agree to complete the work covered in the said schedule of quantities within 120 days from the 15th day reckoned from the date of issue of the work order to commence the work or on which contractor is instructed to take possession of the site, whichever is later.

I/We agree to pay the Government, Goods and Services Tax (State and Central), Excise and Octroi duties, Insurance, labour cess and all other taxes including works contract tax and service tax etc., as the prevailing from time to time, on such items for which the same are leviable, and to get the work, workers, employees (of contractor, Architect & Employer) engaged on the work at site and all materials at site for execution of the work shall be insured comprehensive insurance including fire/accidents/ rain/ floods/riots/CAR policy (contractor's all risk insurance policy) and the insurance shall cover the period from date of start of work to date of actual completion of work plus 3 months. In case part work is taken over by the Employer before final completion of the whole work, such parts may not be covered by the insurance from the date of taking over that part of work by the Employer. Draft Insurance deed will be got vetted by the Architect, before obtaining the same. All the rates quoted by me/ us are inclusive of the same in full and nothing extra shall be claimed anytime on account of any of these.

I/We agree to pay Income tax, to be deducted at source, at the rate prevailing from time to time on the Gross value of the work done, and the rates quoted by me/we are inclusive of same.

I/We agree to pay works contract tax, seigniorage fee to be deducted at source, at the rates prevailing from time to time as per Telangana Govt. Act, as amended and rates quoted by me/us are inclusive of the same.

Yours faithfully,

Contractor's Signature

Address:

Date:

NOTICE TO CONTRACTOR

ADDRESS:

**PROJECT: PROPOSED CIVIL WORKS REPAIR & RECARPETING OF
EXISTING BITUMEN ROAD AT LHO CAMPUS, BANK STREET KOTI
HYDERABAD**

**REF : REPAIR AND REPAIRING AND RECARPETING EXISTING
ROADS**

Dear Sirs,

1. The tenderer must obtain for himself, on his own responsibility and at his own expenses, all the information which may be necessary for the purpose of filling this tender and for entering into a contract for the execution of the same and must examine the drawings and inspect the site of the work and acquaint himself with all local conditions and matters pertaining thereto.
2. Each of the tender documents page is required to be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with the General conditions etc., as laid down. Any tender with any of the documents not so signed will be rejected.
3. The tender documents must be filled in English and all the entries must be made by hand and written in ink. If any of the documents are missing or un-signed, the tender shall be considered invalid.
4. Each and every one of all erasures and additions/alterations made, while filling the tender, must be attested by initials of the tenderer. Over-writing of figures must be attested by initials of the tenderer. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender void. After submission of the tender no advice or any change in rate or conditions will be entertained. All the rates should be quoted both in figures and words. In-case of any discrepancy in rates quoted in

words/figures and the amounts, the rate quoted in words shall be taken as final and binding.

5. The tender shall be valid for a period of 90 days from the date of opening the Envelope No.1
- 6 TOTAL SECURITY DEPOSIT: shall comprise of:
 - a. Earnest Money deposit (Rs.13,000/-)
 - b. Initial Security deposit (2%)
 - c. Retention money @ 5% of value of work
- 11.1 The intending tenderer shall deposit infavour of "Assistant General P&E, SBI, LHO,Hyderabad", Payable at Hyderabad. Those who submitted one time EMD need not submitted again., by Demand Draft a sum of Rs. 13,000/- as the Earnest Money, as a guarantee of good faith, which amount shall be forfeited as liquidated damages, in the event of any evasive/direct refusal or delay in starting the work and or signing the contract. The deposit of the unsuccessful tenderers will be returned, without interest, immediately after a decision is taken regarding the award of the contract. The Earnest money of the successful tenderer will be adjusted towards Security Deposit. A tender not accompanied by Earnest money deposit will not be considered. No concession will be made to Public sector companies from payment of earnest money deposit.
- 11.2 The successful tenderer will have to pay further sum equivalent to 2% of his contract value, less EMD already paid, as initial Security Deposit (ISD) by means of a D.D./Banker's cheque in favour of Assistant General Manager (P&E), SBI, LHO, Hyderabad within 14 days from the date of issue of work order to commence work. The EMD and Security deposit thus paid shall be held by the State Bank of India as Security deposit, for due execution and fulfillment of the contract, till the completion of the work and defect liability period in all respects and shall not bear any interest.
- 11.3 Together with the money paid under clause 11.1 & 11.2 above, further retention of 10% of the value of the work done will be deducted from every running bill, till total retention, including EMD and initial SD paid earlier, comes to 3% of the contract value, and same shall be held by the Bank as Total Security Deposit. On the Engineer certifying the completion of work, 50% of the total security deposit shall be released to the contractor alongwith the final certificate of payment, and the balance amount will be retained in the manner stated elsewhere for a further period of twelve months after the completion date recorded in completion certificate, issued by the Engineer and agreed to by the Bank. Also refer condition 23(ii) on Page 7 of Volume 1.

12. Within one month of the receipt of intimation from the Engineer of the acceptance of his/their tender, the successful tenderer shall be bound to sign an agreement, on a stamp paper in accordance with the Draft Agreement and conditions of contract attached herewith, but the work order or the written acceptance of a tender by the Employer will constitute a binding agreement between the Employer and the person tendering whether such formal contract is or not signed by the contractor.
13. All compensation or other sums of money payable by the contractors to the clients, under the terms of this contract, may be deducted from the Security Deposit or from any sum that may be or may become due to the contractor on any account whatsoever, and in the event of the Security deposit being reduced by reasons of any such deductions, the contractor shall within 15 days of being asked to do so make good in cash or cheque, any sum which have been deducted from his security deposit.
14. The contractor shall arrange for the procurement of all the materials at site as required and directed, and store them in their godown at the site of construction, and also bear all the expense incurred in connection therewith, including payment of taxes, octroi, storage, watch and ward etc.
15. The rates quoted by the Contractor shall include all eventualities, such as heavy rain, sudden floods, accidents, fire, riots etc., which may cause damage to the executed work or which may totally wash out the work. Until the completion certificate is issued to the Contractors, neither the Architect nor the clients will be responsible for such damage or wash out of the construction work.
16. Time is the essence of the contract. The work should be completed **within 45 days**, from the date of commencement. The date of commencement shall be
 - a) The day two weeks from the date of issue of work order.
Or
 - b) The day on which the contractor receives the possession of the site whichever is later.

Or
 - c) The contractor is asked in writing to take over the possession of the site.

The successful contractor will have to give a CPM/PERT chart of various activities of work to be done so that the work gets completed within the

stipulated time. The chart shall be submitted within 15 days from the date of acceptance of the tender.

17. If the contractor fails to complete the work by the Scheduled date of completion or within any sanctioned extended time, he will have to pay liquidated damages at the rate of ½% of contract amount for each week of delay the work remains incomplete beyond the completion(Original/extended date), subject to maximum of 5% of the contract value (without extra items) as per clause 31 of the General conditions of contract.
18. The quantities contained in the Schedule are only indicative. The work as actually carried out and done will be measured up from time to time, for which payment will be made subject to the terms and conditions of contract.
19. The unit prices shall be deemed to be fixed prices. In case of extra items, a record of labour charges paid shall be maintained and shall be presented every month for extra/substituted items regularly to the Engineer for checking. The settlement will be made based on figures arrived at jointly and taking into account unit prices of items of work mentioned in the contract assigned to the successful tenderers. In case, of extra items, where similar or comparable items are quoted in the tender, extra rates shall invariably be based on those tender rates to the extent reasonable.
20. Our clients, State Bank of India, do not bind themselves to accept the lowest or any tender and reserve to themselves the right to accept or reject any or all tenders, either in whole or in part, without assigning any reason whatsoever for doing so.
21. No employee of the bank is allowed to work as a contractor for a period of two years of his retirement from bank service, without the previous permission of the bank. 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 the bank as aforesaid before submission of the tender or engagement in the contractor's service.

FORM OF AGREEMENT

ARTICLES of AGREEMENT made this _____ day of _____ year 2021 between **Assistant General Manager (P&E) , SBI, LHO, Hyderabad** (Hereinafter referred to as the "Employer/Owner/client" which expression shall, unless excluded by or repugnant to the context, includes its successors and assigns) of the ONE PART and _____ of _____ (Hereinafter referred to as "Contractor" unless excluded by or repugnant to the context, includes its successors and assigns) of the OTHER PART.

WHEREAS the Employer intends to carry out **(PROPOSED CIVIL WORKS REPAIR & RECARPETING OF EXISTING BITUMEN ROAD AT LHO CAMPUS, BANK STREET KOTI HYDERABAD)** shall herein after referred to as **"Project"**.

AND WHEREAS for the purpose of the above said project, the Employer invited sealed tenders from experienced, resourceful and bonafied contractors vide his Notice Inviting Tender (NO. _____ dated. _____).

WHEREAS the contractor submitted his Tender Documents containing Notice Inviting Tender, General notes, General Conditions of Contract, Special conditions, Schedule of approximate quantities and rates , Form of Agreement, General Specification, Approved manufacturers/ natural source of materials, Declaration, Technical Specifications as in Schedule of Quantities etc. for the above said project, (Hereinafter collectively referred to as the "said conditions"), duly signed on each page as a token of his acceptance of the same, along with requisite Cost of tender and Earnest Money Deposit

AND WHEREAS out of the Percentage rate tenders received, the Tender of the contractor was found to be most suitable for the project.

AND WHEREAS the Employer has accordingly issued the work order (NO. _____ dt. _____) to the contractor subject to his furnishing the requisite Security Deposit.

AND WHEREAS the Contractor has accepted the aforesaid Work Order vide his letter of acceptance NO. _____ dt. _____ and has also deposited with the Employer a sum of Rs. _____ which with the Earnest Money of RS. _____ forms the requisite Security Deposit @ 2 % of the accepted Tender Value of Rs. _____.

NOW, therefore, it is hereby agreed to and between the parties as follows:

1) Contract documents

The following documents shall constitute the Contract Documents.

I. This Article of Agreement.

II. Tender Document submitted by the Contractor including the "said conditions", N.I.T and Schedule of quantity.

III. All correspondence between the Employer and the Contractor from the date of issue of N.I.T and the date of issue of work order.

IV. Work order No. _____dt. _____

2) In consideration of the payments to be made to the Contractor as hereinafter provided the Contractor shall upon and subject to the said conditions, execute and complete the contracted project works shown upon the said drawings etc. and such further detailed drawings as may be furnished to the contractor by the said Employer and described in the said Specifications and the said Schedule of Quantities.

3) Notwithstanding what are stated in the N.I.T conditions of Tendering, Conditions of Contract of herein stated before, the Employer reserves itself the right of altering the drawings and the nature of the work and addition to or omitting any items of work or of having portions of same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this contract.

4) As mentioned in Article 1 above, the "said conditions" shall be read and be treated as forming part of this agreement and parties hereto will respectively be bound thereby and to abide by and submit themselves to the conditions and stipulations and perform the same on their parts to be respectively observed and preferred.

5) Any dispute arising under this agreement shall be referred to the Arbitration in a manner specified in the General Conditions of the Contract and all legal disputes shall be limited within the territorial jurisdiction of the Hyderabad thereto. The decision of the arbitration shall be final and binding on both the parties.

IN WITNESS WHEREOF THE PARTIES to their present have here under set and subscribed their hands, the day, month and year first above written.

Signed and delivered for and on behalf of

State Bank of India, Shri. _____ its duly authorized official, In the presence of -

1. (Name and Address)

2. (Name and Address)

Signed and delivered for and on behalf of

The Contractor _____ by Shri _____ his duly authorized official, in the presence of -

1. (Name and Address)

2. (Name and Address)

Assistant General Manager (P&E),
SBI, LHO, Hyderabad

READ, UNDERSTOOD AND ACCEPTED

SIGNATURE OF THE CONTRACTOR WITH SEAL
DATE

APPENDIX TO GENERAL CONDITIONS OF CONTRACT

- | | | | |
|------|---|---|--|
| 1. | Earnest Money Deposit (EMD) | : | Rs.13,000/- |
| 2. | Initial Security Deposit (ISD) | : | 2% |
| 3. | Period of completion | : | 7 Days |
| 4. | Defects Liability period | : | 12 months after completion as recorded in the completion certificate. |
| 5. | Agreed Liquidated Damages week of | : | $\frac{1}{2}\%$ of contract amount per delay subjected to a maximum of 5% of contract value. |
| 6. | Period of final measurement completion as | : | Three months after recorded in the completion certificate. |
| 7. | Minimum value of work to be Executed for issue of interim Certificates for making payment | : | Minimum Rs.10.00 Lakhs |
| 8.a) | Retention money from each bill | : | 10% of gross value of each interim bill, subject to 8(b) below. |
| b) | Total retention money including Earnest money and initial security Deposit | : | 5% of the contract value. |
| 9. | Release of Security deposit after Virtual completion. | : | 50% of the total security to be Released along with final certificate of payment, but only after removing all his materials, equipment, labour, huts/force, temporary sheds/stores, all his installations, machinery etc., from the site. Balance payment to be released on submission of Bank Guarantee on any Scheduled Bank, Other than SBI, and its associated |

banks in the prescribed manner and valid till the completion of defects liability period of 12 months plus 3 months.

10. Period for honoring certificate : 15 working days from date of certificate of payment for interim bills and 45 working days for final certificate.

11. Price Variation Adjustment : NO PVA Clause

WITNESS :

DATE : SIGNATURE OF THE CONTRACTOR WITH DATE

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GENERAL CONDITIONS OF CONTRACT

1. INTERPRETATIONS:

In constructing these conditions and the specifications, schedule of quantities and contract agreement, the following words shall have the meaning herein assigned to them except where the subject or context otherwise required:

- a. "Employer" shall mean Assistant General Manager (P&E), SBI, LHO Hyderabad and shall include his/their heirs, legal representatives, assignees and successors.
- b. "Contractor" shall mean

and shall include his/their heirs, legal representatives, assignees and successors.
- c. "Banks Engineer" shall mean any Engineer who is employed by State Bank of India or any other Engineer appointed from time to time by the Employer, and certified in writing to the Architect and the contractor, to act as Engineer for the purpose of the Contract in place of the said engineer.
- d. "Employer's Representative" shall mean Project Management Consultants employed by the Bank/any assistant of the Engineer or any site engineer/ PMC appointed from time to time by the employer to perform the duties set forth in clause 17 hereof whose authority shall be notified in writing to the Architect and Contractor by the EMPLOYER.
- e. "Architects" shall mean any Engineer/ representative appointed by the Bank.
- f. "Works" shall mean the works to be executed in accordance with contract specifications, quantities etc.
- g. "Contract" shall mean the Articles of Agreement, the General Conditions, Special Conditions, the Appendix, the Schedule of Quantities, Specifications and drawings, work order etc., attached hereto and duly signed.

- h. "Contract Price" shall mean the sum named in the Tender, subject to such amount additions thereto or deductions there from as may be made under the provisions, hereinafter contained.
- i. "Site" shall mean the lands and other places as shown on the site plan, on which the works are to be, provided, by the Employer or Architect for the purpose of the Contract.
- j. "Drawings" shall mean the drawings referred to in the contract etc., and any modifications of such drawings approved in writing by the Architect and the Bank and such other drawings as may from time to time be furnished or approved in writing by the Architect and Employer.
- k. "Notice in Writing" or written notice shall mean a notice in writing, typed or printed characters sent (unless delivered personally or otherwise provided to have been received) by registered post to the last known private or business address or registered office of the address and shall be deemed to have been received, when in the ordinary course of post, it would have been delivered.
- l. "Act of Insolvency" shall mean any Act of Insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any act amending such original.
- m. "Net Prices" if in arriving at the Contract Amount, the contractor has added to or deducted from the total of the items of the Tender any sum, either as a percentage or otherwise, then the net price of any items, in the tender, shall be the sum arrived at by adding to or deducting from the actual figure appearing in the Tender, as the price of that item, a similar percentage or proportionate sum. Provided always that in determining the percentage or proportion of the sum so added or deducted by the contractor, the total amount of any Prime cost items and provisional sums of money shall be deducted from the total amount of the Tender. The expression "net rates" or "net prices" when used with reference to the contract or account shall be held to mean rates or prices so arrived at.
- n. "Virtual Completion" shall mean that the building is in the opinion of the Architect and Employer, sufficiently completed for occupation by the Employer, in relation to the scope of work of this contract.
- o. Words importing persons include firms and corporations. Words importing the singular only, also include the plural and vice versa, where the context requires.

2. **SCOPE OF CONTRACT:**

The contractor shall carry out and complete the said work in every respect in accordance with this contract with the directions of and to the satisfaction of the Architect and Employer. Architect, with the approval of the Employer, may issue further drawings and/or written instructions, details, directions and explanations, which are hereafter collectively referred to as "Architect's Instructions" in regard to:

- a. The variations or modifications of the designs, quality or quantity of works or the addition or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the Schedule of Quantities/ or drawings and/or specifications etc.
- c. The removal and/or re-execution or any works executed by the contractor.
- d. The removal from the site of any material brought there on by the contractor, and the substitution of any other material therefrom.
- e. The dismissal from the works of any person employed thereupon.
- f. The opening up for inspection of any work covered up.
- g. The amending and making good of any defects under clause 24 "Removal of Improper works and Materials".

The contractor shall forthwith comply and fully execute any work comprised in such Architect's instruction, provided always that instructions, directions and explanations given to the contractor or his representative upon the works by the Architect shall, if involving a variation, be confirmed in writing by the contractor or within 7 days, and if not dissented from in writing within further 7 days by the Architect, such shall be deemed to be the Architects instructions within the scope of contract.

If compliance with the Architect's instructions as aforesaid involved work and/or expense and/or loss beyond that contemplated by the contract, then unless the same were issued owing to some breach of this contract by the contractors, the employer shall pay to the Contractor on the Architect's certificate, the price of the said work (as an extra to be valued as herein after provided) and/or expense and/or loss.

3. **DRAWINGS AND SPECIFICATIONS:**

The works shall be carried out to the entire satisfaction of the EMPLOYER and the Architect, in accordance with the signed contract document, drawings and specifications and such further drawings and details as may be provided by the Architect, and in accordance with such written instructions, directions and explanations, as may from time to time be given by the Architect and the bank, whose decision as to the sufficiency and quality of the work and materials shall be final and binding on the contractor. If the work shown on any such further drawings or work that may be necessary to comply with any such instructions, directions or explanations, be in the opinion of the contractor outside the scope of work or reasonably could not be inferred from the contract, he shall before proceeding with such work, give notice in writing to this effect to the Architect and the Bank, and in the event of the Architects and the Bank agreeing to the same in writing, the contractor shall be entitled to an allowance in respect of such extra work as an authorized extra. If the Architect and the contractor fail to agree, as to whether or not there is an extra, then, if the Architect decided that the contractor is to carry out the said work, the contractor shall do so, and the question whether or not there is any extra and if so, the amount thereof, shall failing agreement be settled by Arbitration as hereinafter provided, but such reference shall in no way delay the fulfillment of this contract.

No drawing shall be taken as in itself an order for variation, unless in addition to the Architect's signature, it bears express words stating that it is intended to be such an order or bears a remark "VALID FOR CONSTRUCTION". No claim for payment for extra work shall be allowed, unless the said work shall have been executed under the provisions of clause 8 (Authorities, notices, patents, rights and royalties) or by the authorities, of directions in drawing of the Architect as herein mentioned.

One complete set of the signed drawings and a copy of contract document (specifications and schedule of quantities etc) shall be furnished by the Architect to the contractor. The Architect shall furnish within such time as he may consider reasonable, one copy of any additional drawings, which in his opinion may be necessary for the execution of any part of the work. Such copies shall be kept at the works, and the Architect or his representatives shall, at all reasonable times have access to the same and shall be returned to the Architect by the Contractor, before the issue of the final certificate. The original contract documents shall remain in the custody of employer.

Please refer clause 36 of Special conditions of contract.

4. **SCHEDULE OF QUANTITIES:**

The Schedule of Quantities unless otherwise stated shall be deemed to have been prepared in accordance with the Standard Procedure of the Architects

and shall be considered to be approximate and no liability shall attach to the Architect for any error/ variations that may be discovered therein.

Please refer Clause 5, 6 and 40 of Special conditions of contract.

5. **SUFFICIENCY OF SCHEDULE OF QUANTITIES:**

The contract shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the prices stated in the schedule of Quantities and/or the Schedule of Rates and Prices, which rates and prices shall cover all things necessary for the proper completion of the works.

Please refer clauses 5, 6 and 39 of Special Conditions of Contact.

6. **ERRORS IN SCHEDULE OF QUANTITIES:**

Should any error appear in the Schedule of Quantities, other than in the Contractor's prices and calculations, it shall be rectified and such rectification shall not vitiate the contract but shall constitute a variation of the contract and be dealt with as an authorised extra or deduction.

7. **CONTRACTOR TO PROVIDE EVERYTHING NECESSARY:**

The contractor shall provide everything necessary for the proper execution of works according to the true intent and meaning of the drawings, specifications and the Schedule of Quantities etc., taken together, whether the same may or may not be particularly shown or described there in, provided the same can be inferred therefrom. The several document forming the contract are to be taken as mutually explanatory to one another; detailed drawings and figured dimensions in preference to scale, and special conditions in preference to General conditions and particular specifications in preference to General specifications.

In case of discrepancy between the Schedule of Quantities, the specifications and/or the drawings, the following order of preference shall be observed:-

- i) Description of Schedule of Quantities.
- ii) Particular specifications and special condition, if any.
- iii) Drawings.
- iv) C.P.W.D. specifications.
- v) Indian Standard specifications of B.I.S.

If there are varying or conflicting provisions made in any document forming part of the contract, the Architect shall be the deciding authority, with

regard to the intention of the document and his decision shall be final and binding on the contractor.

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 expressed therein according to drawings and specifications or from any of his obligations under the contract.

The contractor shall make his own arrangements for providing water, for carrying out the work, at his own cost. If water from any source other than Municipal main is to be used for construction, the same shall be tested at the contractor's cost, and a report submitted to the Architect for his approval, before such water is used for the works. Temporary Electrical connections shall be obtained by the contractor to facilitate execution and completion of work at their cost and all the charges there of should be borne by them.

The contractor shall supply, fix and maintain at his cost, during the execution of any works, all the necessary centering, scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, hoarding, watching and lighting during nights as well as by day required not only for the proper execution and protection of the said works, but also for the protection of the public and the safety of any adjacent road, streets, cellars, vaults, pavements, walls, houses, buildings and all other erections, matters or things. The Contractor shall take down and remove any or all such centering, scaffolding, staging, planking, strutting, shoring etc., as occasion shall require or when ordered or so to do, and shall fully reinstate at his own cost and make good all the matters and things disturbed during the execution of the works to the satisfaction of the Architects.

Please refer clause 7 of Special conditions of contract.

8. **AUTHORITIES, NOTICES, PATENT RIGHTS AND ROYALTIES:**

The contractor shall conform to the provisions of the statutes relating to the works, and to the regulation and by laws of any local authority, and of any water, lighting and other companies or authorities, with whose systems the structures are proposed to be connected; and shall before making any variation from the drawings or specifications, that may be necessitated by so conforming, give to the Architects a written notice, specifying the variations proposed to be made and the reason for making it and apply for instruction thereon. In case, the contractor shall not within ten days receive such instructions, he shall proceed with the work conforming with the provisions, regulations or by laws in question.

The contractor shall bring to the attention of the Architect all notices required by the said acts, regulations or bylaws to be given to any authority, and pay to such authority or to any Public Officer all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Architects.

The contractor shall indemnify the Employer against all claims in respect of patent rights, designs, trademarks or name or other protected rights in respect of any constructional plant, machine, work or material used for or in connection with works or temporary works and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, unless he has informed the Architects, before any such infringement and received their permission to proceed, and shall himself pay all royalties, licence fees, damages, cost and changes of all and every sort that may be legally incurred in respect thereof. Please refer clause 23 of special conditions of contract.

9. SEIGNIORAGE CHARGES:

The Seigniorage charges will be recovered from contractor's bill as per the rates prescribed in the contract documents for the materials used on the work only. The Seigniorage charges to be deducted at source at the rates prevailing from time to time as per Government of Telangana Department of Mines and Geology Gazette dated 26th September 2015.

RATES OF SEIGNIORAGE FEE

Sl.No	Name of the Minor Mineral	Unit	Rate of Seignorage fee (in rupees)
1	Building stone, rough stone / boulders , road metal and ballast	M3/MT	75/50
2	Dimensional Stone used for Kerbs& Cubes	MT	100/MT
3	Lime Kankar / Limestone	MT	The rate of royalty as applicable to Limestone (other than LD grade) in respect of major minerals as per the 2 nd schedule of the Mines & Minerals (D&R) Act, 1957
4	Marble	M3 /	250/100

		MT	
5	Mosaic chips	MT	45
6	Morrum / Gravel & ordinary earth	M3 /	30/20
		MT	
7	Ordinary sand	M3 /	40/27
		MT	
8	Shingle	M3 /	25/17
		MT	
9	Chalcedoney pebbles	M3 /	75/50
		MT	
10	Fullers / earth / bentonite	MT	150
11	Shale / Slate	MT	150
12	Rehmatti	MT	25
13	Limestone slabs	M2/MT	8/100
14	Brick earth used in the manufacture of bricks including Mangalore tiles		Rs.6000/- per kiln per annum

15	Granite useful for cutting and polishing	Gangsaw above 270 x above 150	Below 270 x below 150	Equal and below
a	Black granite	3000	2300	1200
b	Colour granite	2300	2000	1000

SCHEDULE II : Rates of Deed Rent

Sl.No	Name of the Mineral	Rate of Deed Rent per hectare per Annum (in Rs.)
1	Black Granite	1,00,000
2	Colour Granite	80,000
3	Limestone other than classified as major minerals used for lime burning or building construction purposes, marble, boulders, building stone including stone used for road, metal, fullers	50,000
	Earth, Ballast Concrete and other constructions	

purposes, slate and pyllites

- | | | |
|---|---|--------|
| 4 | Gravel Moorum, Shingle, Limestone Slabs,
used for flooring purposes, Chalcedeny pebbles
used in the building purposes, Limeshell for
burning used for building purposes and
rehmatti. | 40,000 |
|---|---|--------|

10. **MATERIALS AND WORKMANSHIP TO CONFORM DESCRIPTION:**

All materials and workmanship shall, so far as procurable be of the respective kinds specified in the Schedule of Quantities and/or specifications and in accordance with the Architect's instructions and the contractor shall on the request of the Architects furnish to them all invoices, accounts, receipts and the other vouchers to prove that the materials comply therewith. The contractor shall at his own cost arrange for and/or carry any test of any materials, which the Architect & Employer may require. The costs of materials used for testing, packing, transportation and testing shall be borne by the contractor and his quoted rates/amounts shall include all such expenses/contingencies.

- 10a. In case of non-availability of specified Make/brand of any material including steel and cement the alternate make/brand will be given by the Employer/Architect.

11. **THE SETTING OUT:**

The Contractor shall at his own expense, set out the works accurately in accordance with the plans and to the complete satisfaction of the Architect. The Contractor shall be solely responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time any error shall appear during the progress or on completion of any part of the work, the contractor shall at his cost rectify such error if called upon to the satisfaction of the Architects/Employer. The work shall from time to time be inspected by the Architect and/or his representatives, but such inspections shall not exonerate the contractor in any way from his obligation to remedy any defects, which may be found to exist at any stage of the work or after the same is completed, at his own cost.

12. **REMOVAL OF ALL OFFENSIVE MATTERS:**

All soil, filth or other matter of an offensive nature, taken out of any trench, sewer, drain, cesspool or other place shall not be deposited on the surface, but shall at once be carried out away by the contractor to some pits or place

provided by them and shall be disposed off as per the rules and regulations of the Local authorities concerned.

13. **OPENING UP WORKS:**

The contractor shall notify the Architect in writing immediately, the trenches or excavation as shown on the drawings are get ready or as soon as any ground is cut into which, from unexpected causes, appears need for immediate attention. After notifying the Architect, he shall await instructions, which shall be given within ten days of receipt of such notice. If the contractor put in any parts of the foundations before he has so notified the Architect and received instructions, he shall be liable to reinstate all such work that may be subsequently, at any time, damaged on account of any defect or insufficiency of the foundations. The Contractor shall at the request of the Architect, within such time as the Architect so desires, open for inspection any work, and should the contractor refuse or neglect, to comply with such request, the employer, through the Architect may employ other workmen to open up the same. If the said work has been covered up in contravention of the Architect's instructions, or if, on being opened up, it be found in accordance with the drawings and specifications, or the instructions of the Architect or otherwise, the expenses of such other workmen shall be borne by and recoverable from the contractor, or may be deducted from any money due or which may become due to the contractor. If the work has not been covered up in contravention of such instruction, and be found in accordance with the said drawings and specifications and instructions, then the expenses aforesaid shall be borne by the Employer and be added to the contract sum, provided always that in the case of foundations or of any other urgent work so opened up and requiring immediate attention, the Architect shall within seven days after receipt of the written notice from the contractor that the work has been opened, make or cause the inspection thereof to be made, and at the expiration of such time, if such inspection shall not have been made, the contractor may cover the same and shall not be required to open it up again, except at the expenses of Employer.

Refer clause 7 & 24 of special conditions of contract.

14. **CONTRACTOR'S SUPERINTENDENCE & REPRESENTATIVE ON THE WORKS:**

The contractor shall give all necessary personal superintendence during the execution of the works and so long thereafter as the Architect may consider it necessary until the expiration of the "Defects Liability Period" stated in clause 25. The Contractor shall meet the Architect or his representative, whenever required and so informed by the Architect.

The Contractor shall maintain and be represented at site at all times, while the work is in progress, by a responsible and efficient foreman, approved by the Architect and who must thoroughly understand all the trades entailed and be constantly in attendance while the men are at work. Any directions, explanations, instructions or notices give by the Architect & Employer to such foreman shall be deemed to have been given to the contractor and shall be binding as such on the contractor. The Foreman shall be thoroughly conversant with the English language and should be able to read, write and speak English.

15. **DISMISSAL OF WORKMEN:**

The contractor shall on the request of the Architect and Employer immediately dismiss from the works any person employed thereon who may, in the opinion of the Architect and Employer be unsuitable or incompetent or who may misconduct himself, and such person shall not again be employed or allowed on the works without the permission of the Architect & Employer.

16. **ACCESS TO WORKS:**

The Architect, the Employer and any person authorised by them shall at all reasonable times have free access to the works and to the workshops, factories or other places where materials are being prepared or constructed by the contract and also to any place where the materials are lying or from which they are being obtained. The Contractor shall give every facility to the Architect and the Employer and their representatives for inspection and examination and test of the materials and workmanship. No person, unless authorised by the Architect or the Employer, except the representatives of Public authorities, shall be allowed on the works at any time. If any work is to be done at a place other than the site of works, the contractor shall obtain the written permission of the Architect for doing so.

17. **EMPLOYER'S REPRESENTATIVE/PMC:**

The Employer may appoint an assistant to the Engineer, any Site Engineer or Project Management Consultant (PMC), who shall be the representative of the Employer. The duties of the Employer's representatives are to watch and supervise the works and to test any materials to be used and of workmanship employed in connection with the works. He shall have no authority either to relieve the contractor of any of his duties or obligations under the contract, or except those expressly provided hereunder, to order any work involving delay or any extra payment by the Employer or any variation of or in the works.

The contractor shall afford the Employer's representative every facility and assistance for examining the works and materials and checking and measuring item and materials. Neither the Employer's representative nor any assistant to the Architect shall have power to revoke, alter, enlarge or relax the requirements of this contract, or to sanction any new-work, additions, alterations, deviations or omissions unless such an authority may be specially conferred by a written order of the Architect and Employer.

The Employer's representative shall have to give notice to the Contractor or his representing about the non-approval of any work or materials and such works shall be suspended or the use of such materials should be discontinued until the decision of the Architect is obtained. The work will from time to time be examined by the Architect or the Employer's representative, but such examinations shall not in any way exonerate the contractor from the obligation to remedy any defects, which may be found to exist at any stage of the work or after the same is completed. Subject to the limitations of the clause, the contractor shall take instructions only from the Architect and Employer.

18. **ASSIGNMENT OF SUB-LETTING:**

The works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part/share thereof or interest therein without the written consent of the Architect and Employer, and no undertaking shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the works during their progress.

19. **SUB-CONTRACTORS:**

All specialists, merchants, tradesmen, and others, executing any work or supply and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities and/or specifications, who may be nominated or selected by the Architect and employer and hereby declared to be sub-contractors employed by the Contractor, are herein referred to as nominated sub-contractors. No nominated sub-contractors shall be employed on or in connection with the works, against whom the contractor shall make reasonable objection or (see where the Architect and contractor shall otherwise agree), who will not enter into a contract provided.

- a. The nominated sub-contractors shall indemnify the contractor against the same obligations in respect of the sub-contract as the contractor is under, in respect of this contract.

- b. The nominated sub-contractors shall indemnify the contractor against claims in respect of any negligence by the sub-contractor, his servants or agents or any misuse by him or them of any scaffolding or other plant, the property of the contractor or under any Workman's Compensation Act in force.
- c. Payment shall be made by the contractor to the nominated sub-contractor, within 14 days of receipt of the Architect's certificate, provided that before any certificate is issued, the contractor shall upon request furnish to the Architect proof that all nominated sub-contractor's account included in the previous certificates have been duly discharged; in default whereof the Employer may pay the same upon a certificate of the Architect and deduct the amount thereof from any sums due to the contractor. The exercise of this power shall not create any contract between Employer and Sub-contractor.

20. **VARIATIONS NOT TO VITIATE CONTRACT:**

The contractor shall when directed in writing by the Architect, omit from or vary works shown upon the drawings or described in the specifications or included in the priced schedule of quantities, but the contractor shall not make any alterations or additions to or omissions from the works or any deviations from the provisions of the Contract without such authorizations or direction in writing from the Architect and Employer.

No claim for any extra item or deviations shall be allowed, unless it shall have been executed by the Authority of the Architect and Employer as herein mentioned. Any such extra item or deviation is hereinafter referred to as an authorised extra item or deviation. No variations i.e., additions, omissions or substitutions shall vitiate the contract.

The rate of items not included in the bill of quantities shall be settled by the Architect and Employer in accordance with the provisions of clause 21, hereof.

21. **MEASUREMENTS OF WORKS:**

The Architect/PMC may from time to time intimate the Contractor that he requires the works to be measured and the contractor shall forthwith attend or send a qualified agent to assist PMC/Architect's representative in taking measurements and calculations, and to furnish all particulars or give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such an agent, then the measurements and calculations, and to furnish all particulars or give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such an agent, then the measurements taken by the PMC/Architects representative approved by them shall be taken to be the correct measurements. The mode of measurements wherever not mentioned in contract documents be taken in accordance with the Indian Standard of Method of measurements of building works (I.S.1200 – 1958) and its revisions, if any. In case of any discrepancy between various contract documents on mode of measurements, the mode given in Bill of Quantities will take precedence over others.

The contractor or his agent may at the time of measurement take such notes and measurements as he may require.

All authorized extra works, omissions and all variations made without the Architect's knowledge, if substantially sanctioned by him in writing shall be included in such measurements.

22. PRICES FOR SUBSTITUTIONS/EXTRA ETC., ASCERTAINMENT OF:

Should it be found after the completion of the works from measurements taken (in accordance with the previous paragraph) that any of the quantities or amounts specified for the works in the priced schedule of quantities of work thus ascertained are less or greater than the amounts and/or tender or that any variations, is made, and any substituted/ extra (new) items have been executed, the valuation of such quantities/items, amounts or variations, unless previously or otherwise agreed upon, shall be made in accordance with the following rules:

- a. The net rates or prices in the original tender shall determine the valuation of the extra (additional quantities and or extra/substituted item of work), where that work is of a similar character and executed under similar conditions of the work priced therein. This applied to extra and substituted items of work to the extent, they are similar in nature to the items in the contract.
- b. The net prices given in the original tender shall determine the value of the items omitted, provided if omissions vary the conditions under which any remaining items of work are carried out, the prices for the same shall be valued under thereof.
- c. Where extra/substituted item of works are not of similar character (either partly & fully) and/or executed under similar conditions as

aforesaid or where the omissions vary the conditions under which any remaining items of works are carried out or if the amount of any omission or additions relative to the amount of the whole of the contract works or to be any part thereof shall be such that in the opinion of the Architects the net rate or price contained in the priced schedule of quantities or tender or for any item of the work involves less or more beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable for in-applicable, the Architect shall fix in consultation with the Employer such other rates or prices as in the circumstances he shall think reasonable and proper, which shall be final and binding on the contractor. For extra and substituted items this will apply for portions of the items for which, items of similar nature are not available in the contract.

- d. Where extra and or substituted items of work cannot be properly measured or valued, the contractor shall be allowed based on the net local day work rates and wages for the district and prevalent market rates for materials etc., at the time of ordering that item; provided that in either case vouchers for wages paid specifying the daily time (and if required by the Architect, the workmen's name) and materials employed at or before the end of the week following that in which the work has been executed.

The measurements and valuations in respect of the extra and substituted items of work shall be completed within the "Period of final measurement" or within 3 (three) months from the completion of the contract works as defined under clause No.26 (certificate of virtual completion).

See Special Conditions of Contract Clause 44.

23. **UNFIXED MATERIALS:**

When any materials intended for the works shall have been placed at site by the contractor, such materials shall not be removed therefrom (except for the purposes of being used on the works) without the written authority of the Architect and Employer and when the contractor shall have received payment in respect of any certificate in which the architect shall have stated that he has taken into account the value of such unfixed materials on the works such materials shall become the property of the Employer and the Contractor shall be liable for any loss or damage to any such materials.

24. **REMOVAL OF IMPROPER WORK AND MATERIALS:**

The Architect shall, during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable times as may be specified in the order, of any materials which in the opinion of the Architect and Employer are not in accordance with the specifications or the instructions of the Architect and Employer; and the substitution with proper materials and the removal and proper re-execution of any work, which has been executed with materials or workmanship, not in accordance with the contract/drawings and specifications or instructions etc., the contractor shall forthwith carry out such orders at his own cost. In case of default on the part of the contractor to carry out such orders, the Employer shall have the power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other account.

Instead of this procedure for work not done in accordance with the contract, the Architect and Employer may allow such work to remain, and in that case may make allowance for the difference in value together with such further allowance for damages to the Employer, as in his opinion may be reasonable. This allowance shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other accounts. The decision of Architects in these matters shall be final and binding on the contractor.

25. **DEFECTS AFTER COMPLETION:**

Any defect, shrinkage, settlement or other faults which may appear within the "Defects Liability Period" stated in the Appendix on Page 10 i.e. within 12 months after the virtual completion of the works arising in the opinion of the Architect and the Bank, from materials or workmanship not in accordance with the contract, shall upon the directions and writing of the Architect and Employer and within such reasonable time as shall be specified therein, be rectified and made good by the Contractor at his own cost. In case of default, the Employer may employ any other person to amend and make good such defects, shrinkage, settlements or other faults. All damages, loss and expenses consequent therein or incidental thereto shall be made good and borne by the contractor and such damage, loss and expenses shall be recoverable from him by the employer or may be deducted by the Employer, the damages, loss and expenses from any sums that may be due to the contractor or amount retained under condition 38 (Certificate and payment) and in event of the amount retained being insufficient recover

the balance from the amount held against EMD & Security deposit under clause 10.1 & 10.2 on Page 5 or any other amounts due or may become due later.

26. **CERTIFICATE OF VIRTUAL COMPLETION:**

The contractors shall intimate in writing to the Architects, as and when the works are complete in all respects in order to enable the Architect to intimate the Employer to take possession of the same. The works shall not be considered as virtually completed, until the Architect has certified in writing that the same have been "Virtually completed" and accepted by the employer. The defects liability period shall commence, only from the date of such virtual completion certificate.

27. **OTHER PERSONS ENGAGED BY THE EMPLOYER:**

The Employer reserves the right to use the premises and any portions of the site for the execution of any work not included in this contract which he may desire to carry out through other persons, and the contractor is to allow all reasonable facilities for the execution of such work, except by special arrangement with the Employer. Such work shall be carried out in such a manner as not to impede the progress of the works included in the contract, and the contractor shall not be responsible for any damage or delay which may happen to or be occasioned by such work.

28. **INSURANCE IN RESPECT OF DAMAGE TO PERSONS AND PROPERTY:**

The contractor shall be responsible for all injury to persons, animals or things and for all structural and decorative damage to property, which may arise from operation or neglect of himself or any of his or sub-contractor's employees, whether or any other cause whatever in any way connected with the carrying out of this contract. This clause shall be held to include, inter alia any damage to buildings, whether immediately adjacent or otherwise, any damage to roads, caused to the buildings and works forming the subject of this contract by frost or other inclement weather. The contractor shall indemnify the employer and hold him harmless in respect of all and any expenses arising from any such injury or damage to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of government or otherwise, and also in respect of any award of compensation or damages consequent upon such claim.

The Contractor shall reinstate all damages of every sort mentioned in this clause, so as to deliver up the whole of the contract works complete and

perfect in every respect and so as to make good or otherwise satisfy all claims for damage to the property of third parties.

The contractor shall indemnify the Employer against all claims which may be made against the Employer, by any member of the Public or other party, in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own cost, effect and maintain until one month after the works are taken over by the Employer or three months after the date of completion of the contract with an approved office, a policy of Insurance in the joint names of the Employer and the contractor against such risks and signing of the contract. The contract shall also indemnify the employer against all claims which may be made upon the Employer whether under the Workmen's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employees of the contractor or of any sub-contractor and shall at his own expense effect and maintain until one month beyond the virtual completion of the contract, with an approved office. A policy of Insurance in the joint names of the Employer and the Contractor against such risks and deposit such policy or policies with the Architects from time to time, during the currency of the contract. In default of the contractor insuring as provided above, the Architect on behalf of the Employer may so insure and may deduct the premiums paid from any money due or which may become due to the contractor.

The contractor shall be responsible for anything which may be excluded from the Insurance Policies above referred to and also for all other damages to any property arising out of and incidental to the negligent or defective carrying out of this contract however, such damage shall be caused. The Contractor shall also indemnify the Employer in respect of any costs, charges or expenses arising out of any claim or proceedings and also in respect of any Award of or compensation of damages arising there from.

The Employer with the concurrence of the Architect shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or occurring from or in respect of any such claims of damages from any sums due or to become due to the contractor.

29. **CONTRACTOR'S ALL RISK POLICY:**

The contractor shall within 14 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever is earlier, against loss or damage by fire and usual risks other than fire against which insurers generally provide cover in a CONTRACTOR'S ALL RISK POLICY, with an insurer to be approved the

Architects, in the joint names of the Employer and contractor (the name of the former being placed first in the policy), progressively for the full amount of the contract, in three stages, beginning with 1/3 of the contract value, and for any further sum as called upon to do so by the Architect, with the prior written consent of the Employer, the premium of such further sum being allowed to the contractor as an authorised extra. Such policy shall cover the property of the Employer only and Architects and surveyor's fees for assessing the claim and in connection with his services generally in reinstatement and shall not cover any property of the contractor or any subcontractor or employee. The contractor shall deposit the policy and receipts for the premiums paid with the Architects, within twentyone days of the date of commencement of work, unless otherwise instructed, as provided above failing which the employer or the Architect on his behalf may insure and may deduct the premium paid from any money that may be due or that may become due to the contractor. The contractor shall as soon as the claim under the policy is settled, or the work reinstated by the insurers should they elect to do so, proceed with all due diligence with the completion of the works in the same manner as though the fire or other such risk had not occurred and in all respects under the same conditions of contract.

The contractor in case of rebuilding or reinstatement after fire or other such usual risk shall be entitled to such extension of time for completion as recommended by the Architect.

Please refer Special Conditions of Contract, clauses.

30. **MINIMUM AMOUNT OF THIRD PARTY INSURANCE:**

Such insurance shall be effected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the Architect/Consultant the policy or policies of insurance cover and receipts for payment of the current premium.

The minimum insurance cover for physical property, injury, and death is Rs.5.00 lakhs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

31. **COMMENCEMENT AND COMPLETION:**

The contractor shall be allowed admittance to the site on the "Date of Commencement" stated in the Appendix, and he shall thereupon and forthwith begin the works and shall regularly proceed with and complete the same (except such painting or other decorative work as the Architect

may desire to delay) on or before the 'Day of Completion' started in the Appendix subject nevertheless to the provisions for extension of time hereinafter contained.

Refer clause 9 & 36 of Special Conditions of Contract.

32. **DELAY AND EXTENSION OF TIME:**

If in the opinion of the Architect the works be delayed:

- a. by force majeure, or
- b. by reason of any exceptionally inclement weather, or
- c. by reason of proceedings taken on threatened by or dispute with adjoining or neighbouring owners or public authorities arising otherwise, than through the contractor's own default, or
- d. by the works or delays of the contractors or tradesmen engaged or nominated by the Employer or Architect and not referred to in the Schedule of Quantities and/or specifications, or
- e. by reason of civil, commotion, local combination of workmen or strike or lock-out affecting any of the buildings/traders, or
- f. by reason of the Architect's instructions as per clause 2, or
- g. In consequence of the contractor not having in due time, necessary instructions from the Architect, for which he shall have specifically applied in writing ahead of time, giving reasonable time to prepare such instructions.

The Architect shall make a fair and reasonable assessment for extension of time, for completion of the contract works which may be approved by the Employer.

In case of such strike or lock-out, the contractor shall as soon as possible, give written notice thereof to the Architect, but the contractor shall nevertheless constantly use his endeavours to prevent delay and shall do all that may reasonably be required, to the satisfaction of the Architect to proceed with the work.

33. **DAMAGES FOR NON-COMPLETION:**

If the contractor fails to complete the works by the date stated in clause 31 (date of completion) or within any extended time certified under clause 32 (extension of time) and if the Architect shall certify in writing on or before the date of issue of the certificate for the last payment to which the contractor may become entitled hereunder that the works could have been reasonably completed by the said date or within the said extended time, then the contractor shall pay to the Employer or allow the employer to recover from dues to the contractor on any account the sum stated in clause 16 of "Notice to contractors" (Page 6) (liquidated damages and not by way of penalty), subject to a maximum amount of 5% as stated in Appendix of General Conditions of contract (page 10) and as stated in clause 16 of "Notice to contractors" (Page 6) and such damages may be deducted from any money due or which may become due to the contractor.

The deduction of such sums shall not, however, absolve the contractor of his responsibility and obligations to complete the work in its entirety.

Please refer clauses 9 & 36 of special conditions of contract.

34. **FAILURE BY CONTRACTOR TO COMPLY WITH ARCHITECT'S INSTRUCTIONS:**

If the contractor after receipt of written notice from the Architect requiring compliance with such further drawings and/or Architects instruction, fails within seven days to comply with the same, the Architect and Employer may employ and pay other persons to execute any such work whatsoever as may be necessary to give effect thereto and all costs incurred in connection therewith shall be recoverable from the contractors by the employer on a Certificate by the Architect as a debit or may be deducted by him from any money due or which may become due to the contractors.

35. **ARCHITECT'S DELAY IN PROGRESS:**

The Architect may delay the progress of the works in case of rains or otherwise, without vitiating the contract and grant such extension of time with the approval of the Employer for the completion of the contract as he may think proper and sufficient in consequence of such delay, and the contractor shall not make any claim for compensation or damage in relation thereto.

36. **SUSPENSION OF WORKS:**

If the contractor, except on account of any legal restraint upon the employer preventing the continuance of the works, or on account of any of the causes mentioned in the clause "Extension of time" or in the case of certificate being withheld or not paid when due, shall suspend works or in the opinion of the

Architects, shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default in the respects mentioned in clause 24 (removal of improper work and materials), the Employer through the Architect shall have the power to give notice in writing to the contractor required that the works be provided within a reasonable manner, and with reasonable despatch, such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the acts or defaults on the part of the contractor upon which it is based. After such notice shall have been given, the contractor shall not be at liberty to remove from the site of works, or from any ground contiguous thereto, the site of works, or from any ground contiguous thereto, any plant or materials belonging to him which shall have been placed thereon for the purpose of work, and the Employer shall have lien upon such plants and materials to subsist from date of such notice being given until the notice shall has been complied with, provided always that such line shall not under any circumstances subsist after the expiration of 30 (thirty) day from the date of such notice given, unless the employer shall have entered upon and taken possession of the works and site, as hereinafter provided.

If the contractor shall fail for seven days after such notice has been given, to proceed with the works as therein prescribed, the Employer may enter upon and take possession of the works and site, and of all such plants, machinery and materials thereon intended to be used for the works, and the Employer shall retain and hold a lien upon all such plants, machinery and materials until the work shall have been completed, under powers hereinafter conferred upon him;

If the Employer shall exercise the above power, he may engage any other person to complete the works and exclude the contractor, his agents and servants from entry upon or access to the same, except that the contractor or any person appointed in writing may have access at all times during the progress of the works to inspect, survey and measure the works. Such written appointments or a copy thereof shall be delivered to the Architects before the person appointed comes on to the works and the Employer shall take such steps as in the opinion of the Architect may be reasonably necessary for completion the works, without undue delay or expenses using for that purpose the plant, machinery and materials above mentioned in so far as they as they are suitable and adopted to such use.

Upon the completion of the works, the Architects shall certify the amount of the expenses properly incurred consequent on and incidental to the default of the contractor as aforesaid and in completion the works by other persons.

Should the amount so certified as the expenses properly incurred be less than amount which should have been due to the contractor upon the

completion of the works by him, the difference shall be paid to the contractor by the Employer, should the amount of the former exceed the later, the difference shall be paid by the contractor to the Employer. The Employer shall not be liable to make any further payments or compensations to the contractor for or on accounts of the proper use of the plant for the completion of the works under the provisions herein before mentioned other than such payments as is included in the contract.

After the works shall have been so completed by persons other than the contractor, under the provisions herein before contained, the Architect shall give notice to the contractor to remove his plan and all surplus materials as may not have been used in the completion of the works from the site.

If such plant and materials are not removed within a period of 14 days after the notice shall have been given, the Employer may remove and sell the same, holding the proceeds less the cost of the removal and sale, to the credit of the contractor. The Employer shall not be responsible for any loss sustained by the Contractor from the sale of the plant in the event of the Contractor not removing it after notice.

37. **PRIME COST AND PROVISIONAL SUMS:**

- a. Where "Prime Cost" (P.C.) prices or provisional sums of money are considered for any goods or works in the specifications or Schedule of quantities or deviations hereof, the same are exclusive of any trade discounts, or allowances, discount for cash, or profit which the contractor may require and or carriage and fixing.
- b. All goods or work, for which prime cost prices or provisional sums of money are considered may be selected or ordered from any manufacturer's or firms, at the discretion of the Architect or the Employer. The Employer reserves to himself the right of paying directly for any such goods or work and the Architect may deduct the said prices or sums from the amount of the contract. Should any goods or works for which prime cost prices or provisional sums are considered or portions of same be not required, such prices or sums, together with the profits allowed for such additional amount as the Contractor may have allowed for carriage and fixing will be deducted in full from the amount of the Contract. Whether the goods be ordered by the Contractor or otherwise, the contractor shall at his own cost fix the same, if called upon to do so, and the contractor shall also receive and sign for such goods and be responsible for their safe custody as and from the date of their delivery upon the works.
- c. In cases in which provisional quantities of items/materials are contained in the contract, the contractor shall provide such materials and or execute such

items to such amounts or to greater or lesser amounts as the Architect shall direct in his schedule of quantities.

- d. No prime cost sum or sums (or any portion thereof) shall be included in any certificate for payment to the contractor until the receipted accounts relating to them have been produced by the contractor to the Architect. Such accounts shall show all discounts and any sum or sums in respect of such discounts shall be treated as a trade discount. Provided always, that should the contractor in lieu of producing such receipted accounts, request the Architect in writing to issue a certificate to the Employer for such sum or sums, due either on account or in settlement to a sub-contractor direct, the Architect shall, upon satisfying himself that the sub-contractor is entitled to the same, so issue the certificate and such sum or sums be deducted from the amount of the contractor, at the settlement of accounts and any profit or sum to which the contractor is properly entitled, in respect of such sub-contract, and which is in conformity with the terms of contract as though the amount of such certificates to the sub-contractor has been included in a certificate drawn in favour of the contractor.
- e. If the contractor neither produces the receipt nor gives authority to the Architect to issue a certificate in favour of such sub-contractor direct, the Architect may upon giving the contractor SEVEN DAYS NOTICE in writing of his intentions to do so, issue to the sub-contractor such certificate direct to the Employer and obtain a receipt from the sub-contractor, which receipt shall be deemed as a discharge for the amount of such certificates, as though given by the contractor. In such event, the contractor shall not be allowed any profit he may have added in the Schedule of Quantities upon such sub-contract.
- f. The exercise of the option before referred to by the Contractor and the issue of certificates, as before described to sub-contractor direct or certificates by the Architect, shall not however, relieve the contractor from any of the liabilities in respect of insufficient, faulty or incomplete work of the sub-contractor for which he may be liable under the terms of the contract.

38. **CERTIFICATES AND PAYMENTS:**

The contractor shall be paid by the Employer after due checking and after making necessary correction from time to time, by instalments under Interim Certificates to be issued by the Architect on account of the works executed by the contractor based on the joint measurements taken by the PMC, the Architect's representative and the contractor's representative when in the opinion of the Architect, work to the approximate value named in the Appendix on Page 10 as "Value of work for Interim Certificates", (or less at the reasonable discretion of the Architect & Employer) has been executed in

accordance with the Contract, subject however, to a retention of the percentage of such value named in the Appendix hereto mentioned as "Retention Percentage for Interim Certificates", until the total amount retained shall reach the sum named in the appendix as Total Retention Money, after which time the instalments shall be upto the full value of the work subsequently so executed plus such amount as he may consider proper on account of materials delivered upon the site by the contractor for use in the work and available on the date of billing.

And when the works have been virtually completed and the Architect shall have certified in writing that they have been so completed, the contractor shall be paid by the Employer after satisfying himself in accordance with the certificate to be issued by the Architect, the sum of money named in the Appendix as 'Instalment after Virtual Completion' being a part of the said Total Retention Money.

The Contractor shall be entitled to the payment of the final balance (balance security deposit/retention money) in accordance with the final certificate to be issued in writing by the Architect at the expiration of the period referred to as 'The Defects Liquidation Liability period' in appendix on page 10 hereto, from the date of virtual completion or as soon after the expiration of such period as the work shall have been finally completed and all defects made good according to the true intent and meaning hereof, whichever shall happen, provided always that the issue by the Architect of any Certificate during the progress of the works or after the completion shall not relieve the contractor from his liabilities in cases of fraud, dishonesty or fraudulent concealment relating to the works or materials or any matter dealt within the certificate, and in case of all such defects and insufficiencies in the works or materials, which reasonable examination would have disclosed. No certificate of the Architect shall by itself be conclusive evidence that any works or materials to which it relates are in accordance with the contract.

The Architect shall have power to withhold any Certificate, if the works or any parts thereof are not being carried out to his and employers satisfaction. The Architect may by any certificate make any correction in any previous Certificate, which shall have been issued by him. Payment upon the Architect's Certificates shall be made within the period named in the Appendix as 'Period of Honoring of Certificates, after such certificates have been delivered to Employer.

Please refer clause 37 & 46 of Special conditions of agreement.

39. **NOTICES:**

Notices for the Employer, the Architect, or the Contractor may be served personally or by being left at or sent by registered post to the last known

place of abode or business of the party to whom the same is to be given or in the case of the contractor by being left on the works. In case of a company or corporation, notices may be served at or sent by registered post to the Registered Offices of the Company or Corporation. Any notice sent by registered post shall be deemed to be served at the time, when in the ordinary course of post it would be delivered.

40. **TERMINATION OF CONTRACT BY THE EMPLOYER:**

If the contractor being an individual or a firm, commit any act of insolvency, or shall be adjudged as Insolvent or being an incorporated Company shall have an order for compulsory winding up made against it or pass an effective resolution for winding up voluntarily or subject to the Supervision of the Court and of the Official Assignee of the Liquidator in such acts of insolvency or winding up, shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Architect that he is able to carry out and fulfill the contract, and to give security thereof, if so required by the Architect.

Or if the contractor (whether an individual, firm or incorporated Co.) shall suffer execution to be issued.

Or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the Architects/Employer first obtained.

Or shall charge or encumber this Contract or any payments due or which may be due to the Contract thereunder.

Or if the Architect shall certify in writing to the Employer that the contractor,

- a. has abandoned the contract or
- b. has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days, after receiving from the Architect written notice to proceed, or
- c. has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
- d. has failed to remove materials from the site or to pull down and replace work for 7 days after receiving from the Architect written

notice that the said materials or work were condemned and rejected by the Architect under these conditions, or

- e. has neglected persistently to observe and perform all or any of the acts, matters or things by this contract to the observed and performed by the Contractors for 7 days after written notice shall have been given to the contractor requiring the contractor to observe or perform the same, or
- f. has to the detriment of good workmanship or in defiance of the Architect's instructions to the contrary, sublet any part of the contract.

Then and in any of the said cases the Employer with written consent of the Architect, may notwithstanding any previous waiver, after giving 7 days notice in writing to the contractor, determine the contract, but without hereby affecting the powers of the Architect to continue in force as full as if the contract has not been so determined and as if the works subsequently executed has been executed by or on behalf of the contractor.

And further, the Employer under recommendations of the Architect, by his Agents, or servants may enter upon and take possession of the works and all plants, tools, scaffoldings, sheds, machinery, and other equipment and materials also laying upon the premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completion the works or by employing any other contractors or other persons to complete the works and the contractor shall not in any way interrupt or do not act, matter or thing to prevent or hinder such other contractor or other persons or person employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or soon thereafter as convenient, the Architect shall give a notice in writing to the contractor to remove his surplus materials and plant, and should the contractor fail to do so, within a period of 14 days, after receipt thereof by him, the Employer shall sell the same by publication and shall give credit to the contractor for the amount realised. The Architect shall thereafter ascertain and certify in writing under his hand when (if anything) what shall be due to or payable by the Employer for the value of the said plant and materials so taken possession of by the Employer, and the expense or loss, which the Employer shall have incurred due to the contractor, and the amount which shall be so certified shall thereupon be paid by the Employer to the contractor or by the contractor to the Employer, as the case may be.

41. **TERMINATION OF CONTRACT BY CONTRACTOR:**

If payment of the amount payable by the Employer under certificate of the Architect as provided for hereinafter shall be in arrears and unpaid for 30 (thirty) days after notice in writing requiring payment of the amount, as aforesaid shall have been given by the Contractor to the Employer, or if the Employer obstructs the issue of any such certificates, or if the employer commits any Act of insolvency, or if the Employer (being an incorporated company) shall have an order made against him or pass an effective.

Resolution for winding up, either compulsorily or subject to the supervision of the Court or voluntarily, or if the Official Liquidator or the Employer shall repudiate the contract, or if the if the Official Liquidator in any such winding up shall be unable within 15 days notice to him requiring him to do so, to the reasonable satisfaction of the contractor that he is not able to carry out and fulfill the contract and to give security for the same (including Earnest money), or if the works be stopped for any payments due, and to become due thereunder and if required under the order of the Architects or the Employer or by an injunction or other order of any court of law, then in any of the said cases, the contractor shall be at liberty to determine the contract by notice in writing to the Employer/Architect, and he shall be entitled to recover from the Employer, payment for all works executed and for any losses he may sustain, upon any plant or materials supplied or purchased or prepared for the purpose of the contract.

In arriving at the amount of such payment, the net rates contained in the contract shall be followed, or where the same may not apply, valuation shall be made in accordance with clause 22 thereof.

42. Matters to be finally determined by the Architects and the Bank (Called excepted matters) – (refer 43(a) below), which shall be final, conclusive and binding on the following matters:

- a) Instructions
- b) Transactions with local authorities
- c) Proof of quality of materials
- d) Assigning or underletting of the contract,
- e) Certificate as to the causes of delay on the part of the contractor and justifying extension of time or otherwise,
- f) Rectification of defects pointed out during the defects liability period.
- g) Notice to the contractor to the effect that he is not proceeding with due diligence.
- h) Certificate that the contractor has abandoned the contract.
- i) Notice for determination of the contract by the Employer.

43. **ARBITRATION:**

- a. When the contractor is dissatisfied with the decision of the Architect/Employer, the contractor is required to give a notice to the Employer within 30 days of the receipt of such decision, for the appointment of the Arbitrator for the settlement of the outstanding disputes.
- b. Dy General Manager & Chief Engineer shall be appointed to refer those disputes for adjudication to a sole arbitration.
- c. It is also a term of the contract that if the contractor does not make any demand for Arbitrator in respect of any claims within 90 days of receiving the intimation from the Bank that the final bill is ready for payment, the claims if any received after 90 days period shall be absolutely barred from reference to the Arbitrator.
- d. All disputes or differences of any kind whatsoever, which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof this contract, or the rights touching or of this contract, effect thereof, or to the rights or liabilities of the parties arising out of or in relation thereto, whether during progress or after determination, foreclosure or breach of the contract (other than those in respect of which the decision expressed to be final and binding in cases listed out in condition 40 above), Architects shall, after written notice to either party to the contract and to the appointing Authority, who shall be appointed for this purpose by the employer refer those disputes for adjudication to a sole arbitrator, to be appointed as hereinafter provided.
- e. For the purpose of appointing the sole arbitrator referred to above, the Appointing authority will send, within thirty days of receipt by him of the written notice aforesaid, to the contractor a panel of three names of persons, who shall be presently unconnected with the organization for which the work executed.
- f. The contractor shall on receipt by him of the names as aforesaid, select any one of the persons named to be appointed as a sole arbitrator and communicate his name to be appointed as a sole arbitrator to the Appointing Authority, within thirty days of receipt of the names by him. The Appointing Authority shall thereupon without any delay appoint the said person as the sole arbitrator. If the contractor fails to communicate such selection as provided above within the period specified, the Appointing Authority shall make the selection and appoint the selected person as the sole arbitrator.

- g. If the Appointing Authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the appointing authority a panel of three names of persons, who shall be unconnected with either party. The Appointing Authority shall on receipt by him of the names as aforesaid select any one of the persons named and appoint him as the sole arbitrator. If the Appointing Authority fails to select the person and appoint him as the sole arbitrator within 30 days of receipt by him of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the sole arbitrator and communicate his name to the Appointing Authority.
- h. If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reasons whatsoever, another sole arbitrator shall be appointed as aforesaid.
- i. The work under the contract, shall however, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceedings.
- j. The arbitrator shall be deemed to have entered on the reference, on the date he issues notice to both the parties, fixing the date of first hearing.
- k. The arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.
- l. The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be such a place, as may be fixed by the Arbitrator in his sole discretion.

The fees, if any, of the Arbitrator, if required to be paid before the award is made and published, shall be paid half and half by each of the parties. The costs of the reference and of the award including the fees, if any, of the Arbitrator, who may direct to any by whom and in what manner such costs or any part there of shall be paid and may fix or settle the amount of costs to be so paid.

- m. The award of the Arbitrator shall be final and binding on both the parties.
- n. Subject to aforesaid, the provisions of the Arbitration and Conciliation Act, 1996, or any statutory modifications or re-enactments thereof, and the rules made thereunder, and for time being in force, shall apply to the arbitration proceedings under this clause.

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- 6a. Quantities liable to alterations
 - b. Filling of tenders
7. Access for inspection
8. Dimensions
9. Program of works
10. Offices, Stores, Sheds etc., at the site
11. Water and Electricity
12. Procurement of materials
13. Secured advance for materials on site
14. Facilities to other contractors
15. Testing
16. Testing of concrete
17. Site meetings
18. Custody and security of materials
19. Cement
20. Steel
21. Price variations adjustment for all materials and labour

22. Treasure trove
23. Notices
24. Statutory regulations
25. Measurements to be recorded before work is covered up.
26. Working at night or on holidays.
27. Working on holidays
28. Action where there is no specification
29. Reporting of accident
30. Cleaning the site on completion/determination of work
31. Possession of buildings/work completed
32. Typographic, Clerical and other errors.
33. Information to be supplied by the Contractors.
34. Bench marks
35. Force Majeure
36. Architect's drawings and instructions
37. Completion of work and liquidated damages
38. Bill of payments
39. Workmanship
40. Schedule of quantities
41. Site Supervision
42. Engagement of Apprentices
43. Rates
44. Income tax and works contract tax

45. Extra items rates
46. Service drawings/shop drawings/catalogue
47. Payment
48. Permission
49. Maintaining Registers at site
50. Agreement
51. Insurance
52. Indebtedness and liens
53. Work performed at contractor's risk
54. Photographs
55. Inspection by the Chief Technical Examiner
56. Special conditions of contract
57. B.I.S. Codes
58. As built drawings
59. Occupancy Certificate

SPECIAL CONDITIONS OF CONTRACT

1. INSPECTION OF DRAWINGS:

Before filling in the tender, the contractor will have to check up all drawings and Schedule of quantities, and will have to get immediate clarifications from the Architect on any point, that he feels is vague or uncertain. No claim/damages or compensation will be entertained on this account.

2. CONTRACTOR TO VISIT SITE:

Each tenderer must, before submitting his tender, visit the site of works, so as to ascertain the physical site conditions prices and availability and quality of materials according to specifications before submitting the quotations. No excuse regarding non-availability of any materials or changes in the price will be entertained or extra allowed on that account.

The existing adjacent buildings belonging to Govt/private which are in close proximity of the proposed construction, hence the contractor shall cater for all arrangements to carry out the work without causing any disturbance to the occupants by providing screens with bamboo matting or other suitable material approved by Architects/Engineer. The contractor shall ensure that no dust or construction material falls near/around the existing buildings.

3. EXECUTION OF WORK (PRICES TO INCLUDE):

- i) The whole of the work as described in the Contract (including the Schedule of Quantities, the specifications and all drawings pertaining thereto) and as advised by the Architect & employer from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Architect & Employer. Any minor details of construction, which may not have been definitely referred to in this contract, but which are usual in sound building, road and all construction practice and essential to the work, are deemed to be included in this contract. Rates quoted in the Schedule shall be inclusive of all freights, taxes, such as octroi, Sales tax, Royalties, duties, excise, turnover tax, sales tax on works contract, etc., as well as transportation, so as to execute the contract as per the rules and regulations of Local Bodies, State Government and Government of India. Any increase in these taxes and rates, during pendency of contract, shall be borne by the contractor and no extra claim on this account will be entertained.

The rates quoted in the tender should also include all charges for:

- a)
 - 1. Carrying
 - 2. Hauling
 - 3. Labour

4. Fixing
 5. Watering
 6. Cleaning
 7. Making good and
 8. Maintenance etc.
- b) The contractor should arrange timely at his cost for all required.
- i) Plant, machinery, scaffolding, formwork, ladders, ropes, nails, spikes, shuttering, temporary supports, platforms, tools, all materials etc., required for executing the work, and protecting them from weather and other normal/natural causes.
 - ii) Covering/protecting for the walling and other works, during inclement weather, strikes etc., as and when necessary and or as directed.
 - iii) All temporary canvas covers/covering, lights, tarpaulin, barricades, water shoots etc.
 - iv) All stairs and steps, thresholds and any other requisite protection for the works.
 - v) All required temporary weather-proof sheds at such places and in a manner approved by the Architect, for the storage and protection of materials, against the effects of sun and rain.
 - vi) All required temporary fences, lighting/sign-boards etc., guards, approaches and roads as may be necessary for execution of the contract works and for safeguarding the public.
 - vii) The whole of necessary plant and machinery like bull dozers, graders, road rollers, bitumen heating plants, blowers, pumps, concrete mixers, hoists, vibrators, scaffolding, formwork, tackle, cartage, labour etc., and removal of the same at the completion of works.
 - viii) Dewatering by bailing out or pumping out the water from foundation/trenches during the progress of work anywhere on site, to the satisfaction of the Architect & Employer: and clearing of the site.
- c) The Architect & Employer will be the sole judge in deciding as to the suitability or otherwise of the tools/formwork/machinery or plant that may be brought to the work site by the contractor for the proper execution of the work.

- d) The rates quoted by the tenderer in the Schedule of Probable items of work will be deemed to be for the finished work.

4. **R.C.C.WORKS:**

The contractor shall carry out all the RCC works, including formwork, strictly in accordance with drawings, details, relevant BIS specifications, and instructions of the Architects/Employer/Consulting Engineer. If any changes have to be made in the RCC designs, the contractors shall carry out the same without any extra charge. The Architect & Employer's decision in such cases shall be final and shall not be open to arbitration.

5. **SCHEDULE OF QUANTITIES:**

The Schedule of quantities forms part of the contract, but the Employer reserves the right to modify the same or any part thereof as per variation clause stated herein below. The contractor shall not be allowed any compensation or damages for the work which is so omitted or cancelled or added or substituted by the Architect & Employer.

Please refer clause 4 of General Conditions of Contract.

6.a. **QUANTITIES LIABLE TO VARY:**

This clause applies for unlimited variations (+ or -) for items of foundations and those executed below plinth level. For all other items, only in case where + variations of any item exceeds 100% of Quantities of respective items given in the schedule of quantities of the contract, such additional quantities of those items shall be treated as extra items and valued as per clause 45 of special conditions of contract, considering of that rates for these items cannot be derived from the contracted items of work.

The quantities indicated in the bill of quantities are only approximate, and hence may vary on either side (+ or -) for accomplishing the works enunciated under the scope of works, in accordance with designs, drawings and specifications and or instructions of the Architect & Employer. Variations may also occur, consequent upon addition or deletion or substitution of particular items, change of designs or specifications during the course of execution. The contractor, in either case, is bound to carry out the modified quantities upto +100% (plus one hundred percent) variation, without any enhancement in rates and at the same rates as per accepted original tendered rates.

Please refer clause 4, 5 & 6 of General conditions of contract.

b. **FILLING OF TENDERS:**

The rates and amounts for each tendered item should be filled in separate columns provided for in the Schedule of quantities and all the amounts should be totaled up in order to show the aggregate value of the entire tender. All rates shall be filled in both words and figures. These figures and words shall be preceded by 'Rs' and 'Ps' as the case may be, and while filling in words, must end with "Only". Example:

- i) Rs.15.25 (Rupees fifteen and paise twenty five only)
- ii) Rs.20.00 (Rupees twenty only)

The rates quoted in figures should clearly show the rates in full. While filling rates in words, each line should end in '-', and if continued further, last line for the rate of each item shall end in "Only". All corrections, by the contractor in the tender schedule shall be duly attested by the initials of the tenderer. Corrections which are not attested or overwritings in rates may entail the rejection of the tender.

In case the rate written in figures/words/amount differ, the following procedure shall be followed:

- a) When there is a difference between the rates in figures and in words, the rates which correspond to the amounts worked out by the contractor will be taken as correct.
- b) When the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or in words, then the rate quoted by the contractors in words shall be taken as correct.
- c) When the rates quoted by the contractor in figures and in word tallies but the amount is not worked out correctly, the rate quoted by the contractor shall be taken as correct and not the amount.

7. **ACCESS OF INSPECTION:**

The contractor is to provide at all times, during the progress of the works and the maintenance period, means of access with ladders, gangways etc., and the necessary attendants to move and adopt the same as directed for the inspection or measurement of the work by the Architect and Employer or any other agency employed by the client.

Refer clause 7 of General Conditions of Contract.

8. **DIMENSIONS:**

In all cases figured dimensions are to be accepted in preference to scaled sizes. Large scale details shall take precedence over small scale details/drawings. In case of any discrepancy, the contractor shall ask for a clarification, before proceeding with the work. Accordingly, if any work is executed without prior clarification, it is liable to be rejected and shall not be paid for,

9. **PROGRAMME OF WORKS:**

The contractor on starting the work shall furnish to the Employer and Architect a PERT/CPM programme, for carrying out the work stage by stage in the stipulated time, for the approval of Architects and Employer, and follow strictly the approved time schedule by incorporating changes, if any, so authorised by the Architect and Employer, to ensure the completion of construction work ins stipulated time. A graph or chart on individual item/group of items/trades of work shall be maintained, showing the progress both in terms of quantities and value, week by week. The contractor shall submit to the Employer and Architect a weekly progress report stating the number of skilled and unskilled labourers employed on the work, working hours done, quantity of cement, steel and other major items of materials (quantity and value wise) used and corresponding place, type and quantity of work done during the period.

The contractor must inform the Architects, 10 days in advance of requirement of respective drawings and details by him, from time to time. The contractor shall strictly adhere to the approved programme and arrange for the materials and labour etc., accordingly.

Despite repeated instructions, if the contractor fails to show satisfactory progress of the work, the Employer/Architect may take suitable action as deemed fit, including levying of liquidated damages not exceeding ½% of contract price for delay of every week or part thereof, subject to a limit of total liquidated damages levied under this clause to 5% of contract price without prejudice to any terms and conditions of the contract.

Please refer clause 29 & 30 of General Conditions of contract.

10. **OFFICES, STORES, SHEDS ETC., ON THE SITE:**

- a. The contractor shall erect and maintain entirely at his own expense properly lighted, ventilated waterproof and lockable aircooled offices for the Architect's/ Employers representatives and for his own staff respectively on such parts as the Architects shall indicate. Separate offices for Architects and Employers representatives shall be constructed having minimum area of 20 Sqm, as per the sketch plan

and specifications, which will be given by the Architects before starting the work. Contractor shall also provide and maintain, at his own cost, adequate water supply, closets and sanitary accommodation for exclusive use of Architect & Employer's representatives at site. In case, these offices have been provided with AC/GI sheet roofing, the same shall have false ceiling as directed. These offices shall be provided by the contractor with adequate numbers of windows, tables, chairs, steel cupboards, fans, lights and attendants etc., as directed by the architects. Necessary permission from various authorities will be obtained by the contractor and necessary fees shall be paid by the contractor prior to constructing such offices, and as well for stores, huts for labourers or any other temporary structures required for the due execution of work. Any penalty levied by local authorities, for not following their bye-laws/regulations etc., in the matter, will be borne by the contractor. The contractor shall pay for the Electricity and Water charges consumed. All these offices shall be demolished and the materials shall be taken away from site and ground left in good and proper order on completion of work, as required and directed.

- b. The contractor shall provide for all necessary storage on the site, in a specified area for all materials, in such a manner that all such materials, tools etc., shall be duly protected from damages by weather or any other cause. Stores for storage of cement shall have all weather proof floors, walls and roof and have proper locking arrangements and must be secure. All these must be maintained till the work is completed and so certified by the Architect. Necessary and adequate watch and ward for all such accommodations and stores shall be provided for by the contractor at his cost and same included in the rates/amounts quoted by him. All such stores shall be cleared away and the ground left in good and proper order on completion of this contract unless otherwise expressly mentioned herein.
- c. All materials which are stored on the site such as cement, brick, metal sand etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials and prevent deterioration in quality due to water etc.
- d. In addition to the offices provided to Architect's Employer's representative, contractor shall provide accommodation for Project Management Consultants as specified.

11. **WATER AND ELECTRICITY:**

Contractor shall make his own and adequate arrangements for water required for drinking and construction purposes and also for required electric supply at site for satisfactory execution and completion of the work,

at his own cost. The contractor shall get the water used for construction purpose tested periodically as per relevant BIS codes at his cost, and shall get the same approved from Architect and clients before using such water for the work.

12. PROCUREMENT OF MATERIALS:

Contractor shall procure all the materials including cement and steel required for the work from the open market. Time is the essence of the contract. Acceptance of the completion date by the contractor shall mean that he has taken into consideration the availability of all materials of approved make and quality in sufficient quantities at respective markets/sources, to enable him to complete the entire work in the stipulated period.

Contractor will get samples of all materials approved by the Architect and employer, before placing order/purchase/procurement. They shall conform to relevant B.I.S. codes and or tender specifications as applicable.

For all materials, the contractor shall quote for the best quality of the materials of best make/source or supply and they should be got approved by the architect and employer, before procurement.

In case sufficient quantities of approved quality materials from approved sources are not available in time, contractor may have to procure the same from neighbouring areas even with longer leads, as required and directed, at no extra cost. In case approved good quality sand is not available consistently throughout the duration of the contract period, best quality of sand locally available may have to be screened and washed, as directed by the Architect and Employer depending upon the use of sand in different items of work, at no extra cost. The materials will be, however as per relevant I.S.S. as and wherever applicable.

Please refer clause 9 of General Conditions of contract.

12.1 SECURED ADVANCE FOR MATERIALS ON SITE:

The contractor will be paid secured advance against the materials required and brought and stacked safely and securely at site for consumption within 45 days. The advance paid shall be limited to 75% of the cost (limited to costs of materials based on quoted and approved rate for relevant items of work) of the materials stacked at site, and the contractor shall produce necessary cash vouchers/documents in support of the cost of each of such materials for each consignment. In case of sanitary, Water supply and electrical materials, the advance will be restricted to 65% of the quoted rates

for the relevant items in the tender and not exceeding 75% of the cost of those materials in the market. Whenever payment is made on stack measurement basis, necessary deductions for voids will be made, which shall be applicable both for advance and/or for final payment, wherever applicable. These materials shall be stacked on fairly level ground and at safe and secure places, as directed. No secured advance will be paid for materials brought prematurely to the site.

The materials against which advance is paid, shall be the property of the Employer and shall not be removed from the site, without written permission of the Architect & Employer. However, the security of these materials and preventing deterioration of quality of same shall be the sole responsibility of the contractor. The materials shall also be in conformity with the contract specifications and of approved quality/make/brand etc.

The secured advances shall be recovered in the next immediate interim bill.

These advances shall be made on the basis of the quantity of each of the materials lying at site, at the time of preparation of respective interim bill. For all such advances claimed/proposed, the Contractor shall sign an indemnity bond for each of such interim bills, in favour of the Bank, against any loss either due to theft or fire etc. The format shall be finalised in consultation with Architect/Engineer.

13. **SANITARY ACCOMMODATION IN SITE:**

The contractor shall provide and maintain at his own cost and expense adequate closet and sanitary accommodation for the use of his workmen and others in accordance with the rules and regulations of the relevant local authorities.

14. **FACILITIES TO OTHER CONTRACTORS:**

The contractor shall give full facilities and co-operation to all other contractors working at site doing plumbing, Electrical, civil works etc., as directed by the Architect & Employer and shall arrange his programme of work, so as not to hinder the progress of other works. The decision of the Architect & Employer, on any point of disputes between the various contractors, shall be final and binding on all parties concerned.

15. **TESTING:**

The contractor shall, as and when directed by the Architect & Employer, arrange to test materials and/or portions of the work at site in any approved laboratory at his own cost, in order to provide their soundness and efficiency. The contractor shall transport all the materials from site to the

approved laboratory at his own cost. The contractor shall carryout all the mandatory tests as per list attached at the frequencies stated therein. Even after such tests, any materials brought to site or incorporated in the works are found to be defective or unsound or not as per approved samples, the contractor shall remove the same and re-erect at his own cost and without any additional time/period for the same, with reference to the date fixed for completing the work. In case these tests are not carried out at the frequencies stated, then proportionate costs of materials not so tested, including cost of testing and quantities of items of work executed with such materials, if otherwise accepted for retention in the work, will be deducted from the dues to the contractor. The deductions will be worked out by the Architect/client and shall be final and binding on him.

Tolerance on various material and items of work shall be allowed laid down in the documents below and the order of precedence shall be:

- a) Relevant Indian Standards Specifications.
- b) CPWD norms.
- c) Manufacturer's Specifications.

In absence of above Architect's decision basing on the general practice being following shall be final.

16. **TESTING OF CONCRETE:**

The contractor shall make his own arrangements for testing of the concrete blocks at site or in any approved laboratory from time to time, as required by the Architects/ Employer and all the costs of testing and conveyance shall be borne by the Contractor. At least, six blocks of 150 x 150 x 150mm per 20 cum of RCC work or part thereof, for each day's work (subject to the condition that a minimum quantity of 0.5 cum of particular grade/type of concrete is laid on that day) must be taken in steel moulds as directed and tested. The Architect & Employer reserves the right to test the blocks at the cost of the contractor, in the event of the contractor failing to do so. It shall be contractor's sole responsibility to ensure that the blocks are cast, got tested from specifically approved laboratory/test house etc., in time and results reach the Architect, well before measurements for the corresponding work are to be recorded. For any failure in this regard, shall result in rejection of corresponding work(for which the blocks were not cast and or tested in time) and such work shall be dismantled fully alongwith linked up works and redone to required specifications/quality etc., EXCLUSIVELY at contractor's cost. Without any addition time beyond the stipulated/extended time for completion, as the case may be. Application of clauses 15 above in such cases shall EXCLUSIVELY rest within the discretion of the Architect.

17. **SITE MEETINGS:**

A senior representative of the contractor shall attend weekly meetings at works site; and in additions, meetings as and when arranged by Architect & Employer to discuss the progress of the work and sort out problems, if any, and ensure that the work is completed in the stipulated time.

18. **CUSTODY AND SECURITY OF MATERIALS:**

The contractor shall be responsible for the custody and security of all materials and equipment at site and he will provide full time watchman/watchmen to look after his materials, stores, equipments etc., including cement and steel at site and ensure that at no time unauthorised persons gains any access at works site.

19. **CEMENT:**

Cement shall be procured by the Contractor from the manufacturers only; however in case of urgency smaller quantity of cement say less than one lorry can be purchased from authorized dealers after getting the make and quality approved by the Employer and Architect. The brands shall be **ULTRATECH/MAHA/NAGARJUNA/PENNA/COROMANDAL/BHARATI** or any other manufacturer as approved by Architect and the Bank. The contractor should purchase the cement in adequate quantity, quite in advance, in order to have sufficient stocks (not less than the requirement of next fortnight) at site all the time. He will construct cement storage shed of adequate capacity with water tight walls, floor, roof and secure locking arrangements and locking as required and directed. Empty bags will be contractor's property. Contractor's Site Engineer shall maintain cement account at site, showing cement received with details of invoices, etc., quantity used daily (with brief details of items/location of works on which used), and progressive consumption and balance at site. This register will be checked periodically by Architect & Employer representative. Actual cement consumption will be periodically checked with the theoretical cement consumption. 75% secured advance will be paid to the contractor in his corresponding interim bills, for the cement laying unused at site and in good condition. Damaged cement will not be allowed to be used in work. Transportation of cement, within the site, will be carried out by the contractor, as and when required, at not extra cost. The secured advance paid in any bill will be fully recovered in the next bill.

20. **STEEL:**

Steel shall be procured by the contractor from **SAIL/TISCO/VSP/JSW** or any other manufacturer as approved by Architect. The contractor shall produce necessary cash vouchers in support of the purchases and also test certificates, for conforming the quality. All wastages, rolling margins, site tot site transportation shall be borne by the contractor. Contractor shall maintain at site, steel account showing – steel received at site (consignment wise and section wise) and steel used (section wise) for work corresponding to each of the bills,etc., which shall be subject to checking by client/ Architect 75% of the value of the steel physically available at site in good condition and quantities limited to actual requirements of next 30 days (reckoned from date of corresponding bill) plus 1% for wastage and variation will be paid. This exercise is to be section-wise. Theoretical quantity of consumption of steel shall be actual quantities measured plus 10% towards wastages and variations (rolling margins) and on this basis, balance quantities at site may be provisionally arrived at. All scrap steel at site and unused steel at site to the extent not required on the work shall be contractor's property and contractor will be allowed to take it away after measurements/weight, and after getting necessary permission in writing from the Architect & Employer. In case of any discrepancy between the actual quantity of steel lying at site and the balance quantity as per record, the decision of the Architect/client shall be final and binding. The secured advance paid in any bill will be fully recovered in the next bill.

21. **NO PRICE VARIATION ADJUSTMENT (PVA) IS PAYABLE DURING THE EXECUTION OF PROJET**

GENERAL PRICE VARIATION ADJUSTMENT (PVA) CLAUSES FOR ALL MATERIALS (INCLUDING CEMENT & STEEL) & LABOUR

During the stipulated period of completion i.e. 12 months, the rate quoted shall be firm and shall not be subjected to any exchange variation, labour condition, fluctuation in railway freight and any other condition. NO PRICE VARIATION ADJUSTMENT (PVA) is allowed during stipulated period of completion i.e. 12 months. In case the period of completion is extended beyond 12 months for the reasons not attributable to the contractor, then PVA will be applicable for the value work executed after stipulated completion period of 12 months and is calculated as under

$$(i) \quad \text{MATERIALS: } V_m = \frac{70}{100} [0.88 v - (C+S+X)] \times \frac{(W_I - W_{IO})}{W_{IO}}$$

Where:

V_m = Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

V = Value of work done excluding advances on materials, if any during

the period under reckoning.

- C = Cost of grey cement used in the work. (Cost of materials supplied/ arranged by the Bank at fixed prices during the period under consideration).
- S = Cost of Steel used in the work. (Cost of materials supplied/ arranged by the Bank at fixed prices during the period under consideration).
- X = Cost of any other material supplied at fixed basic rate.
- WI = Average all India Wholesale Price Index for all commodities for the period under reckoning as published in the RBI Bulletin. In case the tender is opened on or before 10th day of a month, on Index, of previous month shall be considered.
- WIO = All India Wholesale Price Index for all Commodities during the month of opening of the tender, as published in the RBI Bulletin.

ii) LABOUR:
$$VL = \frac{30}{100} \times [0.88V - (C+S) \times \frac{(I - IO)}{IO}]$$

Where:

VL = Variation in labour cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

V,C&S = As stated under (i) above

I = Average All India Consumer Price Index Number for Industrial Workers declared by Labour Bureau, Government of India, as published in RBI, Bulletin during the months of opening of the tender. In case the tenders are opened on or before 10th day of a month the Index for last month shall be considered.

IO = All India Consumer Price Index Number for Industrial Workers declared by Labour Bureau, Government of India, as Published in RBI, Bulletin during the months of opening of the tender. In case the tenders are opened on or before 10th day of a month the Index for last month shall be considered.

1. Adjustments based on the above formulae will be made for each bill as and when the indices are published. The contractors shall submit the bill for price adjustment with detail calculations.

2. The downward adjustment on account of labour element will be made only if the minimum wages also register corresponding fall compared to the minimum wages prevailing in the month of opening of the tenders.
3. In case the work is not completed within the contract period including authorized extension and the provision of liquidated damages has to be enforced, this adjustment clause will not be applicable for work done during that period. It is also clarified that price adjustment clause will not be applicable to any extra variation items, the rates of which are based on prevailing market rates.
4. In view of the price adjustment in cost being covered as above, no other adjustments viz., increase or decrease due to statutory measures/levies, etc., will be allowed for any reason whatsoever.
5. In case the bill is submitted to the Assistant Engineer prior to 15th of a particular month, index for that month will not be reckoned for calculating the average indices for arriving at the adjustment. If however, the bill is submitted on or after 15th, the Index for that particular month shall be taken into consideration.
6. Immediately on award of contract, the contractor shall register with the appropriate authority obtain Sales Tax Registration No. and produce the details thereof to the Bank within 30 days on the award of the work and in no case later than the submission of his first running bill.
7. The successful tenderers may also note that the Bank reserves the right to deduct Sales Tax on works contract applicable and to be levied under relevant Act, from the bills and amount due to them from Bank and remit the same directly to the Government in case they are not submitting the proof/evidence of having paid the Sales Tax on work executed under this contract.

22. **TREASURE TROVE:**

Should any treasure, fossils, minerals, or works or art of antiquation interest be found during excavation or while carrying out the works, the same shall be the property of the Employer. The Contractor shall give immediate notice to the Architect & Employer about finding of any such treasure and hand over the same on demand to the Employer.

23. **NOTICES:**

The contractor shall give all notices and pay all necessary and relevant fees and shall comply with all Acts and Regulations, for the successful completion of the contract work.

Please refer clause 8 of General Conditions of Contract.

24. **STATUTORY REGULATIONS:**

The whole of the work including sanitation and electrical is to be complied with, as per the requirements and bylaws of the relevant statutory authorities, including Contract Labour (Regulation and Abolition) Act, 1970.

25. **MEASUREMENT TO BE RECORDED BEFORE WORK IS COVERED UP:**

The contractor shall take joint measurements with the Employer's representative (Project Management Consultant or any Engineer identified by the Bank) and Architect's representative before covering up or otherwise placing beyond the reach of measurement any item of work. Should the contractor neglect to do so, 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.

Refer clause 20 of General Conditions of Contract.

26. **WORKING AT NIGHT OR ON HOLIDAYS:**

The contractor can carry out major work at night, only with prior permission of the Site Engineer of Employer/Architect and with proper supervision. However, all concrete work will be carried out only during the day light.

WORKS AT NIGHT:

If the contractor is required to do preliminary works at night, in order to complete the work within the Time Schedule, the contractor shall provide and maintain at his own cost necessary and sufficient barricades/lights etc., to enable the work to proceed satisfactorily without danger. Approaches to the site also shall be sufficiently lighted by the contractor.

27. **WORKING ON HOLIDAYS:**

No work shall be done on Sunday or other Bank holidays that may be notified by the Architect & Employer, without the specific sanction in writing of the Architect & employer or his representatives.

28. **ACTION WHERE THERE IS NO SPECIFICATION:**

In case of any item/class of work, for which there is no specification mentioned (either in part or full), the same will be carried out in accordance with the relevant CPWD specifications (only for the specifications missing in the contract) and if not available even there (either in part or full) in, relevant standards of BIS shall be followed (only for the portions of specifications missing in the contract specifications and CPWD specifications). Indian standard specifications, subject to the approval of the Architect & Employer.

29. **REPORTING OF ACCIDENT TO:**

The contractor shall be responsible for the safety of all persons employed by him on the works and shall report serious accidents to any of them, whenever and wherever occurring on the works, to Employer who shall make every arrangement to render all possible assistance. This shall be without prejudice to the responsibility of the Contractor, under the Insurance clause of the General Conditions. Contractor shall take all the precautions as detailed in the safety code attached separately.

30. **CLEARING THE SITE ON COMPLETION/DETERMINATION OF WORKS:**

The contractor shall clear the site of works as per the instructions of the Architect. The site of works shall be cleared of all men, materials, sheds, huts etc., belonging to the contractor. The site shall be delivered in a clean and neat condition, as required by Architect, within a period one week after the job is completed. In case of failure by the contractor, the Employer, under advice to the Architect, have the right to get the site cleared to his satisfaction at the risk and cost of the contractor.

31. **POSSESSION OF BUILDINGS/WORK COMPLETED:**

The contractor shall hand over to the Employer possession of the completed works in stages, as and when required, and as directed by the Architect & Employer.

The Employer will take over the possession of completed works in stages as directed by the Architect, and defects liability period will commence only from the date of final handing over of all the work accordingly.

Please refer Appendix to General Conditions of contract.

32. **TYPOGRAPHIC, CLERICAL AND OTHER ERRORS:**

The Architects/Employer's clarification regarding partially omitted particulars or typographical, clerical and other errors shall be final and binding on the contractors.

33. **INFORMATION TO BE SUPPLIED BY THE CONTRACTOR:**

The contractor shall furnish to the architect & Employer the following from time to time:

- a. Detailed industrial statistics regarding the labour employed by him, etc., every month (within 5th of succeeding month),
- b. The Power of Attorney, name and signature of his authorised representative, who will be in charge for the execution of work.
- c. The list of technically qualified persons (to be approved by the Architect) employed by him for the execution of the work within 15 days from date of start of work,
- d. The total quantity and quality of materials used for the works, every month within 5th of succeeding month.
- e. The list of plant and machinery employed for this work, every month. Copy of log books shall also be submitted every month (within 5th of succeeding month).

Last para of clause 33:

Failure to submit any of these details in time, shall be treated as a breach of the contract and likely to result in,

- i) Levying a fine of Rs.500 for each default for each month, and
or
- ii) Withholding payments, otherwise due.
- iii) For the periods for which name of technically qualified persons are not given or for which such persons are not employed, recoveries shall be made at Rs.7,500/- per month for each month of default.

In all these matters the decision of the Architect shall be final and binding.

See clause 41 also.

34. **BENCH MARKS:**

The contractor shall construct and maintain proper benches at different places at site as required and directed by the Architect, so that levels can be checked accurately at all times during the progress of work. In case benches are disturbed for any reason whatsoever, necessary rectification shall be carried out by the contractor at his cost as directed by the Architect & Employer.

35. **FORCE MAJEURE :**

Neither party shall be held responsible by the other for breach of any condition of this Agreement, attributable to any "Act of God", Act of State, Strike, lock-out or control or any other reason, beyond the control of the parties and any breach of clauses arising from such Force Majeure conditions as aforesaid shall not be regarded as breach of the provisions of this Agreement.

36. **ARCHITECT'S DRAWINGS AND INSTRUCTIONS:**

A set of major drawings, along with the contract documents shall be provided to the contractor. If any clarification or further drawings are required by the Contractor during or before the start of construction work, the contractor shall inform the Architects and the Bank sufficiently in advance in writing to provide the same. Working details will be given to the Contractor from time to time, during the progress of work, as and when required. In case, any other drawing/detail is required by the contractor, he will give a minimum of fifteen days notice to the Architect.

Refer clause 2 & 3 of General conditions of contract.

37. **COMPLETION OF WORK AND LIQUIDATED DAMAGES:**

The work shall be completed in 45 Days, and reckoned as under:

- (a) The day two weeks from the date of issue of work order.
- or
- (b) The day on which the contractor receives the possession of the site – whichever is later.

or

(c) The contractor is asked in writing to take over the possession of the site.

Time is the essence of the Contract. The Contractor shall strictly adhere to the programme/chart agreed to. In case the contractor fails to complete the work as mentioned above, the liquidated damages may be imposed at the rate of 0.5% per each week (or part thereof) of delay, subject to a maximum of 5% of contract amount.

Refer clause 30 & 31 of General Conditions of contract.

38. **BILLS OF PAYMENTS:**

The minimum value of work for interim payments will be Rs.50.00 lakhs, as stated in Appendix. The contractor shall submit interim bills, once a month on the basis of joint measurements recorded at site by the contractor's Employer's and the Architects representatives. The bill will be certified by the Architect within 15 working days from the date of submission of the bill by the contractor, and the Employer will make payment as stated in the Appendix to General Conditions of Contract. All such interim payments shall not be considered as an admission of the due performance of the contract or any part thereof in any respect and shall not preclude the requiring of bad unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected at contractor's cost, all as per Employer and Architect's instruction and directions.

39. **WORKMANSHIP:**

Quality of materials and workmanship shall conform strictly to specifications given/stipulated in the tender/contract, and contractor will ensure that the best quality of work will be done to the satisfaction of the Architect and Employer, with strict control on the materials, workmanship and supervision.

Refer clause 9 of General Conditions of Contract.

40. **SCHEDULE OF QUANTITIES:**

Quantities mentioned in the Schedule of Quantities, included in the contract, are approximate and are subjected to variations as per actual site conditions & requirements and as directed by the Architect & Employer. The work shall be executed and completed accordingly.

Refer clause 4, 5 and 6 of General Conditions of Contract.

41. **SITE SUPERVISION:**

The contractor shall appoint at his own cost competent and adequate number of qualified Engineers at site, for (1a) joint measurements and preparations of bills. (2b) for testing materials at site and outside laboratory. (c) for concreting and reinforcement work. (d) for other general supervision. Their appointment shall be approved by the Architect & Employer. The site engineers shall not be removed from the site without the written consent of the Architect & Employer.

See clause 33 above also.

42. **ENGAGEMENT OF APPRENTICES:**

The Contractor shall during the currency of the contract, when called upon by the clients, engage and also ensure engagement by sub-contractors and others employed by the contractor in connection with the works such number of apprentices in the categories mentioned in the act and for such period as may be required by the clients. The contractor shall train them as required under the Apprentice Act 1961 and the Rules made thereunder and shall be responsible for all obligations of the clients under the said Act, including the liability to make payment of apprentices, as required under the said Act.

43. **RATES:**

Contractor shall quote all the rates both in figures and in words and any alterations shall have to be initialled by the contractor. Rates quoted by the contractor for the same item in different schedules shall be same, and incase different rates are quoted, the lowest will be taken as correct and the schedule corrected accordingly. In case of discrepancy between rates given in words and figures or in the amount worked out, the following procedure will be followed:

- (a) When there is difference between the rates in figures and in words, the rates which correspond to the amounts worked out will be taken as correct.
- (b) When the amount of an item is not worked out by the contractor or does not correspond with the rate written either in figures or in words, then the rate quoted in words will be taken as correct.
- (c) When the rate quoted by the contractor in figures and words tallies but the amount is not worked out correctly, the rate quoted will be taken as correct and not the amount.

Rates quoted by the contractor shall hold good for all the work carried out upto any height and depth, as shown in detailed drawings

and laid down in bill of quantities and or as required and directed by the Architect.

Rates quoted by the contractor shall also hold good for any small works at any place at site.

Minor repairs and works to other existing buildings and services shall also be carried out by the contractor at rates quoted in the tender.

The rates quoted for all items of work shall include all the items of work covered by the specifications for the corresponding item of work, unless otherwise specifically mentioned to the contrary (NOT IMPLIED) elsewhere.

44. **INCOME TAX AND GST :**

Income tax shall be deducted at source by the client from the contractor's interim and final bill payments as required by law. And GST Will be paid Extra.

45. **EXTRA/SUBSTITUTED ITEM RATES:**

Such items shall be executed as per directions/instructions of the Architects of the employer.

The work on extra/substituted items shall be started only after the receipt of written order from the client/Architect. Rates for additional/extra or substituted (altered) items of work, which are not covered in the contract cannot be derived from the contract item rates either in full or partly, shall be calculated on the basis of actual costs plus 15% for overhead and profit etc., only to the extent not derivable from the contract item rates.

See clause 21 of General Conditions of Contract.

46. **SERVICES DRAWINGS/SHOP DRAWINGS/CATALOGUE:**

After getting approval from the Architect & Employer, the contractor shall submit to the concerned local authorities necessary services drawings showing layouts etc., for getting approval of the schemes. On completion, the contractor shall arrange to get Drainage Completion Certificate and other Certificate necessary for obtaining Building Completion certificate. The contractor shall furnish completion drawings of all services in triplicate, showing the work as actual executed, along with levels. Contractor shall submit for approval 4 copies of shop drawings/ catalogue/ equipment characteristics/ manufacturer's specifications, drawings etc., as and when required and directed by the Architect & Employer. Costs of all these are

deemed to have been included in the respective item rates quoted by the contractor and nothing extra shall be paid on account of any of these requirement/acts.

47. **PAYMENT:**

No payment whatsoever shall be made by the Employer, if the Contractor abandons the work, due to any site difficulties etc.,

See clause 36 & 37 of General conditions of contract.

48. **PERMISSION:**

The contractor shall also obtain necessary permission for using explosive (if required and specifically permitted by the Architect and Employer in writing), as per rules and regulations of relevant authorities, and all other approvals from the relevant authorities shall be obtained by the contractor at no extra cost.

49. **MAINTAINING REGISTERS AT SITE:**

The contractor shall maintain registers for consumption of various specials, testing of materials etc., in the proforma which shall be given by the Architect & Employer from time to time.

50. **AGREEMENT:**

The successful contractor shall be required to enter into an agreement in accordance with the Draft Agreement and Schedule of Conditions etc., within 15 days from the date the contractor is advised by the Architect & Employer that his tender has been accepted. The contractor shall pay for all stamps and legal expenses incidental thereto. However, the written acceptance of the tender by the Employer, will constitute as a binding contract between the Employer and contractor, whose tender has been accepted, whether such formal agreement is or is not subsequently executed.

51. **INSURANCE:**

The contractor shall provide insurance in respect of damage to persons and property and firm insurance as per clause 27 and 28 of General conditions of contract. In addition he will also insure against riots and civil commotion. The insurance shall also cover third party and all the persons working at site and visitors including contractor's, worker's, Architect's and clients people, other contractor's workers etc. The contractor shall indemnify the Employer against any claim or compensation or mishaps of whatsoever nature at site during the progress of work.

The contractor shall prove to the Architect/Client from time to time that he has taken out all the insurance policies as required and directed and has paid the necessary premium for keeping the policies valid as per clause 27 & 28 of the General Conditions of Contract.

In case of failure by the Contractor or sub-contractor to effect and keep in force the insurance policies, then the client, without being bound to, may pay such premiums as may be necessary and deduct the same from any money due or which may become due to the contractor or recover the same as a debt due from the contractor.

52. **INDEBTEDNESS AND LIENS:**

The contractor agrees to furnish the Employer from time to time, during the progress of the work as requested, verified statement showing the contractor's total outstanding indebtedness in connection with the work covered by the contract. Before final payment is made, the Employer may require the contractor to furnish the Employer with satisfactory proof that there are no outstanding debts or liens in connection with the contract. If during the progress of the work, the contractor shall allow any indebtedness to accrue to sub-contractor or other and shall fail to pay or discharge same within five (5) days after demand, then the Employer may withhold any money due to the contractor until such indebtedness is paid, or apply the same towards the discharge thereof.

53. **WORK PERFORMED AT CONTRACTOR'S RISK:**

The contractor shall take all precautions necessary and shall be responsible for the safety of the work and shall maintain all lights, guards, signs, barricades, temporary passages or other protection necessary for the purpose. All work shall be done at the contractor's risk and if any loss or damage shall result from fire or from any other cause, the contractor shall promptly repair or replace such loss or damage free from all expenses to the Employer. The Contractor shall be responsible for any loss or damage to materials, tools or other articles used or held for use in connection with the work. The work shall be carried on to Employer or of others and without interference with the operation of existing machinery or equipment, if any.

54. **PHOTOGRAPHS:**

The contractor at his own cost shall take photographs of site and individual buildings during the progress of the work as directed by the Architect/Client and submit two copies of each photograph with minimum size 20 cm x 15 cm to the client/ Architect.

55. **INSPECTION BY THE CHIEF TECHNICAL EXAMINERS (VIGILANCE):**

The proposed work covered under this tender, during the progress and/ or after completion, can also be inspected by the Chief Technical Examiner/ Technical Examiner or Officers of the Central Vigilance Commission, Government of India, on behalf of Architect & Employer to ascertain that the execution of the work has been done with materials and workmanship all as stipulated in the contract and as directed.

Contractor shall afford all reasonable facilities to the above vigilance staff and also provide them with ladders, tapes, plumbob, level etc., as required and directed and also necessary labourers skilled/unskilled to enable them to complete their inspection/study/technical scrutiny and no extra shall be admissible to the contractor on this account.

56. **SPECIAL CONDITIONS OF CONTRACT:**

In the event of any discrepancy with clauses mentioned anywhere else in the tender with the clauses mentioned within special conditions of contract, the clauses mentioned within the special conditions of contract shall supersede there mentioned elsewhere.

57. **BIS CODES**

It is compulsory for the contractor to keep all the B.I.S. codes mentioned in this tender document at his cost at the site to ensure the proper supervision/quality of work and materials.

58. **AS BUILT DRAWINGS: Not Applicable**

59. **ALL STATUTORY SANCTIONS FOR POST CONSTRUCTION WORKS.**

The contractor shall obtain all sanctions required for building construction and occupancy ie., **post construction (occupancy certificate)** approvals from such local authorities as are concerned such as Hyderabad Municipality and any other departments etc., all as per existing rules relevant on the subject. All official payments would be made by Bank.

INDEX FOR SPECIFICATION FOR CIVIL WORK

MATERIALS GENERAL

- A. EXCAVATION/SOIL TREATMENT
- B. PLAIN, REINFORCED CEMENT/PRECAST CONCRETE
- C. BRICK MASONRY
- D. RUBBLE MASONRY
- E. CEMENT PLASTERING/CEMENT POINTING
- F. FLOORING
- G. WOOD WORK
- H. ALUMINUM DOORS AND WINDOWS
- I. WATER PROOFING
- J. PAINTING/POLISHING WORK

SPECIFICATIONS FOR CIVIL WORK

MATERIALS - GENERAL

- a. All the materials required in the construction shall conform to the relevant latest Indian Standards specifications unless otherwise indicated. For patented products, the specifications and instructions of the manufacturers will be followed. In case where there are no specifications, then Architects/Employers instructions will be followed. In Case of any discrepancy/dispute regarding specifications, Architect and Employer's decision will be final and binding.
- b. Materials shall be transported, landed and stored at the site or elsewhere in such a manner as to prevent any damage, deterioration or contamination.
- c. The samples of all materials shall be got approved by the Architect and Employer prior to ordering and shall be kept at site office of the Architect & Employer. The materials brought to site shall conform in all respects to the approved samples. Any work executed, without approval for the materials, is liable to be rejected. Accordingly, it will be paid either at tender rates or reduced rates or not to be paid at all, at the discretion of Architect & Employer, whose decision will be final and binding.
- d. The Architect & Employer shall have an option to have any materials tested at the contractor's cost to find out whether they are in accordance with the specifications. All Bills, vouchers, test certificates shall be produced for inspection on demand by the Architect & Employer to ascertain the quality/suitability of materials.
- e. The materials shall be stacked at site as directed by the Architect & Employer.
- f. Any materials rejected by the Architect & Employer, shall be removed by the contractor from the site within 24 hours at his own cost.
- g. The contractor shall include the elements of wastage of materials in his rates for various items.

- h. The Architect & Employer shall have the power to cause the contractors to purchase and use such material from any particular source at his opinion be necessary for proper execution of work.

A. **EXCAVATION:**

A - 1. **EXCAVATION AND EARTH WORK:**

A.1.1. **Examination of the Site:**

The contractor shall visit and ascertain the nature of the ground to be excavated and the works to be done and shall accept all responsibility for the cost of the work involved.

A.1.2. **Setting out:**

The contractor shall set out the center line of the building or other involved works after clearing the site and get the same approved from Architect & Employer. It shall be the responsibility of the Contractor to install substantial reference marks, bench marks etc., and maintain them as long as required by the Architect & Employer. The Contractor shall assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

A.1.3. **Ground level and Site level:**

Before starting the excavation, the requisite block levels of the entire plot shall be taken by the contractor, in consultation with the Architect & Employer, and a proper record of these levels kept, which shall be jointly signed by the contractor and the Architect & Employer. A block level plan showing all ground levels of the plot shall be prepared and shall jointly be signed by the contractor and the Architect & Employer. The levels shall be taken at intervals of 3M, or even less, as required and directed.

A.1.4(a) **Excavation and Preparation of foundation for concreting:**

Excavation shall include removal of all materials of whatever nature at all depths and whether wet or dry, necessary for the construction/foundation and sub-structure (including mass excavation for underground reservoirs, where applicable) exactly in accordance with lines, levels, grades and curves shown in the drawings or as directed by

the Architect & Employer. The bottoms of excavation shall be levelled both longitudinally and transversely or sloped as directed by the Architect & Employer.

Should the contractor excavate to a greater depth or width than shown on the drawings, he shall at his own expense fill the extra depth or width in cement concrete in proportion as directed by Architect & Employer but in no case with concrete of mix leaner than 1:4:8 cement concrete, at no extra cost.

The contractor shall report to the Architect & Employer when the excavations are ready to receive concrete. No concrete shall be placed in foundations until the contractor has obtained Architect and Employer's approval. In case, the excavations are done through different strata of soil and if the same are payable as per provisions in the Schedule of Quantities, the contractor shall get the

dimensions/levels/ heights of each of the strata recorded/decided by the Architect & Employer for payment. If no specific provision is made for different strata in the schedule of quantities, it will be presumed that excavation shall be in all types of soil and the contractor's rate shall cover for the same viz., for all types of soil (only excluding hard rock, when so specifically provided for).

After the excavation is passed by the Architect & Employer and before laying the concrete, the contractor shall get the depth and dimensions of excavations and levels (and nature of strata as applicable as per Schedule of Quantities like hard rock, soft rock etc.) and measurements recorded from the Architect & Employer.

Measurement of Excavation in Rock:

Excavated soft/disintegrated rock and hard rock should not be mixed up and shall be stacked separately for purpose of payment. (Even otherwise they shall be stacked separately, and not mixed up with soils). Minimum of the quantities arrived at from

- i) Levels/pit measurements for sheet rock.
- ii) Volume based on stack measurements reduced by 40% to account for voids in stacks for Builders/overcops.

shall be considered for purpose of payment.

A.1.4(b) The contractor shall be responsible for safe custody of these stacks, till the same are taken over by the Employer or completion of work, whichever is earlier. The rates quoted for excavation shall include costs of all these and nothing extra shall be paid towards the same.

A.1.5 **Shoring:**

The sides of the excavations should be timbered and shored in such a way as is necessary to secure them from falling in, and the shoring shall be maintained in position as long as necessary. The contractor shall be responsible for the proper design of the shoring to hold the sides of the excavation in position and ensure safety against injury to persons. The shoring shall be removed as directed after the items for which it is required are completed. In case the contractor wants to step/slope the sides of foundation suitably, in lieu of shoring, he should get prior approval for it from the Architect & Employer and nothing extra shall be paid for same and as well for the additional back fill necessitated by it, viz., items of excavations and backfilling be limited to excavations as per plans only and no quantities involved in making slopes and consequent back filling will be paid for.

A.1.6. **Earthwork for leveling of the area:**

Before earthwork is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, site grass, brushwood and trees and saplings of all girths, and rubbish removed outside the periphery and as directed by the Architect & Employer. The roots of trees shall be removed to a minimum depth of 600mm below ground level or 300mm below formation level whichever is lower and the hollows filled up with approved earth, levelled and rammed to the satisfaction of the Architect & Employer.

Under no circumstances undermining or undercutting be allowed. The final surface shall be neatly dressed and compacted to the required levels. Any extra cutting done, shall be filled back with approved earth, duly consolidated at contractor's cost. During the execution of the work, the natural drainage of the area shall be maintained by the contractor.

The approved earth from cutting shall be directly used for filling as directed. The filling shall be done in layers of not more than 150mm, each layer watered and consolidated with roller, not less than 10 M.T. roller. The earth used for filling shall be free from all roots, rubbish, grass, and all lumps and clods shall be broken before filling. The top surface of finally finished area shall be neatly dressed and compacted.

A.1.7 **Protection:**

If instructed by the Architect & Employer all foundation pits, and similar excavations shall be provided with strong fence and marked with red lights at night to avoid accidents. Adequate protective measures shall be taken to see that the excavation does not affect or damage adjoining structures. All measures required for the safety of the excavations, the people working in and near the foundation trenches, property and the people in the vicinity shall be taken by the contractor at his own cost, he being entirely responsible for any injury and damage to property caused by his negligence or accident due to his constructional operations.

A.1.8 **Stacking of excavated materials:**

All materials excavated will remain the property of the Employer and rate for excavation includes sorting out of useful materials and stacking them on site as directed. Materials suitable and useful for back filling, plinth filling or leveling of the plot or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach on the area required for constructional purposes.

A.1.9 **Backfilling:**

All shoring and formwork shall be removed after their necessity ceases and trash/slush of any sorts shall be cleaned out from the excavation. All space between foundation masonry or concrete and the sides of excavation shall be refilled to the original surface with approved excavated materials in layers, each not exceeding 150mm in thickness, watered and rammed. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure. Where excavated materials are to be used for refilling, it shall be brought from the place, where it is temporarily stacked, and used in refilling.

No excavation of foundations shall be filled in or covered up, until all measurements of excavations, masonry, concrete and other works below ground level are jointly recorded. Black cotton soil shall not be used for back filling or in plinth filling. In case back filling is done without recording measurements of foundation work, the contractor will have to remove back filling at his cost for taking measurements. Otherwise, the foundation work will not be measured and will be paid for.

A.1.10 **Dewatering:**

Rate for excavation shall including bailing or pumping out water, which may accumulate in the excavation during the progress of work either

from seepage, springs, rain or any other cause whatsoever, and diverting surface flow, if any, by bunds or any other appropriate means. Pumping out water shall be done in such an approved manner as to preclude the possibility of any damage to the foundation trenches, concrete of masonry or any adjacent structure. When water is out water shall be from auxiliary pits of adequate size, dug slightly outside the building excavations, the depth of auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilling with approved excavation materials after the dewatering is over.

The excavation shall be kept free from water:

- a. During inspection and measurement.
- b. When concrete and/or masonry are in progress and till they come above the natural water level and
- c. Till the Architect & Employer consider that the concrete/mortar is sufficiently set.

A.1.11 Rates quoted for excavation shall include all these (A.1.1. to A.1.10) operations to the extent required for completing the work please see A.3 also, unless otherwise specifically provided for.

A.1.12 **Surplus excavated materials:**

The item of removal of surplus excavated materials shall only be undertaken by the contractor when specific instruction in this regard has been obtained from the Employer/Architect. The contractor must also secure the approval of the Architect & Employer regarding the quantity of surplus materials to be removed prior to commencement of this item of work. The contractor shall dispose of surplus excavated materials anywhere with in the site as required and as directed. He will spread the same in layers of 150mm each and as directed. Contractor will take the decision of Architect & Employer for disposal of surplus excavated material and no extra will be paid for double handling of the same, if any. Wherever surplus or unsuitable material is to be disposed off outside the site, it shall be dumped and spread at the places to be specifically approved and as directed by the Architect & Employer, with all leads and lifts (unless otherwise provided for), and shall be paid as a separate item, as stated in the schedule of quantities.

A - 2 **ROCK EXCAVATION:**

A.2.1 **Ordinary Soft rock comprises of:**

- a. Limestones, sandstones, laterite or disintegrated rock which can be split or be quarried with crow bars or wedges.
- b. Unreinforced cement concrete, stone masonry in cement mortar.

A.2.2. Hard rock comprises of:

- a. Any rock or cement concrete for the excavation of which the use of mechanical plant or blasting is required, or which cannot be removed with iron crow bars.
- b. Reinforced cement concrete below ground level.
- c. Where blasting is prohibited for any reasons, the excavation has to be carried out by chiselling, wedging or any agreed method.
- d. Rock which requires chiselling/blasting/compressor.

A.2.3 Hard rock encountered in excavation work shall be removed by chiselling or wedging as directed by the Architects/Employers and no blasting is permitted.

A.2.4 Rock excavation shall comply with the specifications for excavation, except that it shall be of soft or hard rock.

A.2.5 Rock excavation will be measured and paid for quantities computed from (i) pit measurement/levels or (ii) by stack measurements reduced by 40% to account for voids, whichever is less.

A -3 RATES TO INCLUDE FOR EXCAVATION ITEMS:

Apart from other factors mentioned elsewhere in this contract, rates for the item of excavation shall also include for the following:

- A.3.1. Clearing the site of all bushes, grass, roots of trees etc., and carting away from the site.
- A.3.2. Setting out works, profiles etc., as required.
- A.3.3. Providing shoring and shuttering to avoid slipping/sliding of soil and to protect adjacent structures, and subsequently removing the same.
- A.3.4. Bailing and pumping out water as required and directed.

- A.3.5. Excavation at all depths (unless otherwise specified in the schedule of quantities) and removal of all materials of whatever nature, wet or dry, with all leads (unless otherwise provided for) and necessary for the construction, foundation, underground reservoir etc., preparing bed for laying concrete, for roads etc., and completing the work.
- A.3.6. Sorting out useful excavated material and conveying beyond the structure and stacking them neatly on the site for back filling or reuse etc., as directed.
- A.3.7. Necessary protection including labour, barricades, materials and equipments etc., to ensure safety and protection against all risks and accidents.

Please see A.1.11.

A - 4 MODE OF MEASUREMENT:

- A.4.1 Excavation for foundation of columns, beams, walls, and the like shall be measured and paid net as per drawing, dimensions of concrete (bed concrete where so specified) at the lowest level. In regard to length and breadth and depth shall be computed from the concerned excavation levels and ground level taken before excavation. Any additional excavation required for working space, formwork, planking, dewatering and strutting etc., shall not be measured and paid for separately but rates quoted for excavation shall include for all these factors. No increase in bulk after excavation shall be paid for. Excavation beyond dimensions of mass concrete for foundation as per drawing or below required depth shall not be paid for. Any excavation beyond required level shall be filled back with cement concrete of mix not leaner than 1:4:8, at his cost.
- A.4.2 Measurement for general excavation/filling in roads/areas shall be made on sectional measurement by taken levels jointly before starting the work and after completion of the work and shall be worked out on average area method. This will give the total quantity of excavation. Levels shall be taken at 3m intervals or closer as required and directed by the Employer & Architect.
- A.4.3. In the case of filling by morrum brought from outside, the quantities will be worked out from levels, as stated above, and shall be calculated/checked with lorry measurements, after deducting 20% for shrinkage. In case of inadequate information regarding lorry

measurement and/or number of lorry trips, Employers/Architect's decision will be final and binding.

A.4.4 In case of all fillings, in exposes and open areas, 10% deduction will be made from the total quantities in the running bills, out of which 5% will be deducted permanently and balance 5% will be paid after expiry of the defects liability period of one year or one monsoon, whichever is more and after making good levels, surface etc., as required and directed.

A.4.5 In case of soft and hard rock, payments shall be limited to minimum of the quantities arrived at from levels or stack measurements (after deducting 40% for voids). The material shall be stacked on fairly level ground and places, as directed. All depressions over the required final levels will be made good by P.C.C. of mix not leaner than 1:4:8 as directed, at no extra cost.

A.4.6 The quantity of excavated materials disposed off outside the premises will be worked out on the basis of total quantity of excavation less follows:

A.4.6.1. Quantity of excavated (other than rock) materials used for filling (on the basis of levels).

A.4.6.2. Quantity of rock excavation (Stack measurements less 40% or level basis).

A.4.6.3. Quantity of excavated materials disposed of within the site (on the basis of levels).

The quantity worked out on these basis will be checked with lorry measurements, with deduction of 20% for looseness/shrinkage. In case of any discrepancy, Architect & Employer's decision will be final and binding.

A.4.7. Total quantity of excavation and filling will be finalised on the basis of levels only. The total quantity of excavation will be checked by adding quantities of the following items:

A.4.7.1. Material used for filling wherever required (on level basis).

A.4.7.2. Rock excavation minimum of quantity arrived from stack measurements with 40% voids) or based on levels.

A.4.7.3. Surplus/unsuitable material disposed within site on level basis (deducting 10% voids if consolidated, otherwise deducting 20%). In case of lock 40% voids will be deducted.

A.4.7.4. - do - disposed outside site (on lorry measurements and by deducting 20% for looseness/shrinkage if transported by lorries, otherwise on basis of levels and by deducting 10% voids if the fill is consolidated - otherwise 20% voids shall be considered.

In case of any discrepancy, the decision of Employer & Architect shall be final and binding for the above sub-divisions A.4.7.1, A.4.7.2, A.4.7.3 & A.4.7.4 as stated above.

A.4.8. Whenever the contractor is instructed to reuse the excavated rock for works such as masonry, soiling, filling etc., the measurement for such items shall be the same/equivalent as that of rock measured under excavation items earlier. The contractor will not be paid for double handling of such excavated materials.

A - 5 **SOIL TREATMENT:**

Soil treatment for pre-construction termite control shall conform to the following:

A.5.1.	Chemicals	Concentration
	ChlorophyriphosEmulsifiable Concentrate 20%	1% strength applied in oil solution or water emulsion.

A daily record shall be maintained by the contractor indicating quantities of chemical brought to site, used on work with location/stage of treatment (the quantum/ area of work done) and the upto date quantity of chemical consumed for the work and upto date balance at close of work on that day. This record book shall be property of the employer.

A.5.2. **Method of application and treatment - All as per IS 6313 (Part - II) - 1981.**

A.5.2.1 **Conditions of formations:**

Barrier shall be complete and continuous under the whole of the structure to be protected. All foundations shall be fully surrounded by

and in close contact with barrier of treated soil. Each part of the area treated shall receive the prescribed dosage of chemical.

A.5.2.2. Time of Application:

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

A.5.2.3. Disturbance:

Once formed, treated soil barriers shall not be disturbed. If, by chance treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.

A.5.2.4. The chemical emulsions shall be applied uniformly at the prescribed rate in all the stages of the treatment. A suitable hand operated compressed air sprayer or watering can should be used to facilitate uniform dispersal of the chemical emulsion. On large jobs, a power sprayer may be used to save labour and time.

In the event of waterlogging of foundation, the water shall be pumped out and the chemical emulsion applied when the soil is absorbent.

A.5.2.5. Treatment for Masonry foundations and Basements as per clause 6.2 of IS 6313 (Part II) – 1981.

A.5.2.6. Treatment for RCC Foundations and Basements as per clause 6.3 of IS 6313 (Part II) – 1981.

A.5.2.7. Treatment of top surface of plinth filling as per clause 6.4 of IS 6313 (Part II) – 1981.

A.5.2.8. Treatment of junction of the wall and the floor as per clause 6.5 of IS 6313 (Part II) – 1981.

A.5.2.9. Treatment of soil along external perimeter of building as per clause 6.6 of IS 6313 (Part II) - 1981.

A.5.2.10. Treatment of soil under Apron along External perimeter of the building as per clause 6.7 of IS 6313 (Part II) – 1981.

A.5.2.11. Treatment for walls retaining soil above floor level as per clause 6.8 of IS 6313 (part II) – 1981.

A.5.2.12. Treatment of soil surrounding pipes, waster and conduits as per clause 6.9 of IS 6313 (Part II) – 1981.

A.5.2.13. Treatment for expansion joints as per clause 6.10 of IS 6313 (Part II) – 1981.

A.5.3. **Guarantee : 10 years (as per form enclosed on requisite stamp paper)**

In the unlikely event of any re-treatment becoming necessary subsequently during the guarantee period, necessary inspection and re-treatment, as required, shall be carried out, free of cost, by the contractor.

A.5.4. **The rate to include:**

The contractor should include in his rates given in schedule of quantities in Sq.meter area basis, all the stages of treatment, Viz., bottom of foundations, sides of trenches, underside of the floors, underside/damp proof courses, outer faces of external walls upto plinth protection, and around all pipe lines at ground level etc., and finally the back fill all around and in the building as per detailed specifications mentioned above. Where the rate of applications of the insecticide has not been specified clearly, the rates of application of chemical should be so governed that during the guarantee period, no trouble may arise. Payment will be made on the plinth area measurement of ground floor only, and the rate for the same should include all the stages of work as mentioned above and no extra on any account will be entertained.

B. **PLAIN AND REINFORCED PRECAST CONCRETE WORK:**

B.1. **APPLICATION OF SPECIFICATIONS:**

B.1.1 Notwithstanding what is stated in the specification herein, detailed architectural and structural drawings and notes appended there on shall be deemed to form part of the specifications and to supersede these, in case of any discrepancy.

B.2. **GENERAL:**

B.2.1 The structural and architectural drawings shall be studied thoroughly and any discrepancy in the dimensions on the drawings or any other point not clear to the contractor shall be brought to the notice of Architect & Employer well in advance, and got decided from them before further proceeding with the work.

B.2.2. No concrete works shall be carried out in the absence of authorised and qualified supervisor of the client/ Architect.

B.3. **MATERIALS:**

B.3.1. **General:**

B.3.1.1. All the materials constituting the concrete shall conform to the relevant latest Indian Standard Specifications, unless otherwise indicated.

B.3.1.2. Materials shall be transported, handled and stored on the site or elsewhere in such a manner as to prevent damage, deterioration or contamination.

B.3.1.3. All the materials such as sand, coarse aggregates, cement and water shall be got tested in any approved laboratory, as directed by the Employer & Architect, before starting the concrete work. During construction also all these materials will have to be tested, as often as deemed necessary by the Employer & Architect.

B.3.2. **Cement:**

Cement shall be ordinary Portland cement 43 grade and of approved brand confirming to IS 1812 - 1989 unless otherwise specified. The contractor shall procure cement of makes - **ULTRATECH/MAHA/NAGARJUNA/PENNA/COROMANDAL/BHARATI** or any other manufacturer as approved by Architect. The contractor may use ordinary Portland Cement of 53 grade of the makes specified above by obtaining written permission from the Architects/Bank. It shall be stored by the contractor in a dry, watertight and properly ventilated structure as per specified conditions. The cement shall be stacked on a dry raised platform, 1'-0" above the floor level and shall be stacked in the sequence of receipt of consignments. Not more than 10 bags should be kept in one stack. Any cement which has deteriorated , caked or which has been damaged due to any reason whatsoever shall not be used. Cement, concerning which there is any doubt, shall be got tested by the contractor at his cost and used, only if found satisfactory. Condemned/damaged cement shall be removed immediately from the site by the contractor at his cost.

Daily account of receipt and use of cement bags shall be maintained by the contractor in the proforma approved by the Architects/Employer and got checked by the Employer's Engineer at site. Cement should be used in the order in which it is received at site. Cement stored for more than three months shall be got tested, before using it in the work.

B.3.3. Sand:

Sand shall be well graded, coarse in texture, clean, hard and free from salt, earth, clay or any other harmful material. Before starting the work, the contractor shall get samples of sand, locally available from different sources, if required, and the same shall be got tested as per latest relevant B.I.S. codes for concrete work and to get the final approval of Employer & Architect. During the course of the construction or for any reasons it is observed that the sand, procured by the Contractor from previously approved source, is not upto the approved standard or it is not available in sufficient quantity required for the entire project, then the contractor will have to make such alternative arrangements to procure the sand of approved quality from any other source, even with longer lead at no extra cost. Sand shall be screened and washed, if required, as directed by the Employer & Architect/at no extra cost. Field tests shall be carried out regularly and as directed, to ensure the suitability/quality of the same. Silt content should not exceed 8% by volume or 5% by weight, and should be free from other deleterious materials. When sand is mixed by volume, necessary allowance shall be made for bulkage, as required and directed to give correct mixture.

B.3.4. Coarse Aggregate:

Coarse aggregates shall consist of hard, dense, durable uncoated crushed Granite rock. It shall be free from soft, friable, thin or long laminated pieces. All aggregates should generally confirm to IS 383 - 1970. For reinforced cement concrete, the maximum size shall be not more than 20mm and minimum shall not be less than 5mm and shall be uniformly graded to the approval of Employer & Architect. If locally available coarse aggregate is not suitable or is not sufficient in quantity, the contractor shall have to procure it from any other source, even with longer leads at no extra cost. As and when directed by Employer & Architect, aggregates shall be washed by approved methods at contractor's cost. Necessary tests shall be carried out, as and when required to ascertain about the suitability and grading of the aggregated, by the contractor at his cost.

B.3.5. Water:

Water shall be clean, fresh and free from organic or inorganic matters in solution or suspension in such amounts, that may impair the strength or durability of the concrete. Water fit for drinking will generally be found suitable for use in concrete and plastering work. However water shall be tested periodically for its use in construction work.

B.3.6. Reinforcement:

B.3.6.1. Mild steel bars:

Mild steel reinforcement bars shall conform to I.S.432 – 1982 “Part I” Fe 410 – S, other qualities of steel shall not be acceptable.

B.3.6.2. High strength deformed bars:

Where deformed high strength reinforcement bars are specified, the contractor shall use tor steel, accompanied by a test certificate from the manufacturer, conforming to IS – 1786 – 1986 and shall be Fe 500 grade. Contractor shall bet steel reinforcement tested at his cost as and when required and directed by Employer & Architect.

Steel shall be from the main manufacturers i.e., **SAIL/TISCO/VSP/JSW** or any other manufacturer as approved by Architect & Employer.

B.3.6.3. Cleaning of reinforcement:

Before steel reinforcement is placed in position, the surface of the reinforcement shall be cleaned of loose rust or scaling, dust, grease and any other objectionable substances as required and directed.

B.3.6.4. Bar bending schedule of reinforcement:

On receipt of structural drawings, contractor shall prepare bar bending schedules of reinforcement and shall get it approved by the Employer & Architect, in advance before starting the work.

B.3.6.5. Cutting and Reinforcement:

Before steel reinforcement bars are cut, the contractor shall study the lengths of bars required as per drawings and shall carry out cutting, only to suit the sizes required as per drawings so that the wastage is minimum.

B.3.6.6. Placing and Security:

Reinforcement bars shall be accurately placed and secured in position and firmly supported or wedged by precast cement mortar concrete blocks of suitable mix, thickness and size, at sufficiently close intervals, so that the bars will not sag between the supports or get displaced during the placing of concrete or any other operation of the work. It is most important to maintain reinforcement in its correct position without displacement and to maintain the correct specified cover. The contractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct position.

B.3.6.7. Binding wire:

The reinforcement shall be securely bound wherever bars cross/lap or whenever required with 2 strands of suitable length of 18 gauge soft annealed steel wire.

B.3.6.8. Welding:

Welding of bars, in place of splicing, shall not be carried out, unless specifically authorised in writing by architect & employer, and the welding shall be as per relevant I.S. code of practice. However, no extra payment shall be allowed for the same.

B.3.6.9. Bends etc:

Bends, cranks, curves, etc., in steel reinforcement shall be carefully formed and shall strictly confirm to the drawings/requirements, care being taken to keep bends out of winding. Otherwise, all rods shall be truly straight. If any bend/crank shows signs of cracking, such rods/bars shall be removed immediately from the site. For bending of bars to any curvature, minimum radius of 9 times diameter of the bar shall be used, unless otherwise specified in the drawings. However, in respect of standard hooks, the radius of bends shall be two times the diameter of bar. Heating of reinforcement of bars to facilitate bending will not be permitted. The bars shall always be bend cold. In case of mild steel reinforcement bars of larger sizes, where cold bending is not possible, they may be bent by heating, but only with written permission of the Architect & employer. Bars when bent shall not be heated beyond cherry red colour, and after bending shall be allowed to cool slowly, without quenching. The bars damaged or weakened in any way in bending shall not be used on the work. High strength deformed bars shall in no case be heated to facilitate bending or cranking.

B.3.6.10 Inspection of Reinforcement:

No concreting shall be commenced until the Architect & Employer have inspected the reinforcement in position and their approval obtained. A notice of atleast 72 hours shall be given to the Architect & Employer by the Contractor for inspection of reinforcement. If in the opinion of the Architect & Employer any material is not in accordance with the specification or the reinforcement is incorrectly spaced/bend or otherwise defective, the contractor shall immediately remove such materials from the site and replace with new ones and rectify any other defects in accordance with the instruction of the Architect and Employer and to their entire satisfaction.

B.3.6.11 Net Measurement:

Reinforcements shall be placed as shown on the structural drawings and payment will be made based on and limited to the net measurements, as per drawings. Only such laps, dowels, spacers, chairs etc., in reinforcement specifically shown on drawings shall be paid for. The contractor shall allow in his quoted rates for all wastages and rolling margins, which will not be paid for. The measured length of all the bars shall be converted into weight, as per standard weights given in latest I.S.Schedule. In case the weights of any bar/bars are less than the required weight (beyond rolling margins specified by B.I.S.) the same shall not be used on work. If used, the same shall be replaced with proper ones, at no extra cost.

B.3.6.12 Cover for Reinforcement:

Unless otherwise specified in drawings, cover shall be measured from outer surface of the main reinforcement and shall be as follows:

- a. For beams and lintels – 25mm or dia of the bar, whichever is higher.
- b. For slabs, chajjas, canopies, pardas – 15mm or dia of the bar, whichever is higher.
- c. Columns – 40mm, or dia of bar, whichever is higher.
- d. Footings – 50mm.
- e. Cover blocks shall be of (1:1½:3) P.C.C. and of thickness, not less than the cover specified. Cover blocks of 1:2 cement mortar may be allowed, if specifically permitted by the Architect. PVC cover blocks of required cover is also allowed.

B.3.6.13. Rates quoted for reinforcement, in addition to any factors mentioned elsewhere, shall also include for:

- a. Stock piling of reinforcement as described.
- b. Decoiling, straightening (coiled bars, bent bars).
- c. Removal of rust and every other undesirable substances, using wire brushes etc., as required/directed.
- d. Cutting to required lengths, labour for bending and cranking, forming hooked ends (if required), handling, hoisting, placing in position, tying binding with binding wire and every thing necessary to fix reinforcement in work as per drawings/requirements.
- e. Cost of binding wire required as described.
- f. Fabricating and fitting reinforcement, in any structural member, irrespective of its location, shape, dimension and level.
- g. Cost of precast concrete/mortar cover blocks of proper size or nylon spacers to maintain cover and holding reinforcement in position.
- h. Work at all levels.

B – 4 **FORM WORK:**

B.4.1. **Materials and design:**

Contractor shall get the materials, sizes/arrangements and method of supports, details of joinery, and design of formwork for beams, slabs, columns etc., approved by Architect, before starting the formwork.

B.4.2. **Design of Form work:**

- i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.
- ii) The formwork shall be so designed that the sides of the beams can be first struck, leaving the soffit of beams and supporting props in

positions. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete.

iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.2.1 The form work shall be of approved plywood (Marine or boiling waterproof) and not less than 12mm thick and with proper supports as may be approved by Architect & Employer. As an alternative sufficiently rigid steel shuttering with appropriate supports may be used, as may be approved by Architect & Employer at not extra cost. In every case, joints in the shuttering are to be such as to prevent loss of liquid from concrete. In case of steel shuttering, the joints must be perfectly close and sealed with craft paper or any other types of approved sealing materials. If any particular material or materials are specified in the Schedule of Quantities for form work, only such particular/ specified material or materials shall be used in the work. The form work shall be constructed so as to remain sufficiently rigid during placing and vibrating/tamping of the concrete. All shuttering and framing must be adequately stayed and properly supporting the concrete during period of hardening. The forms shall have sufficient strength and rigidity to hold concrete and withstand the forces/pressure of people and machinery working ramming and vibration, and more so when the concrete is tamped/vibrated. The surface of all forms in contact with concrete shall be clean, rigid, watertight, and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

B.4.2.2. The form work shall conform to the shape, lines and dimensions to suit the RCC members, as shown in the drawings and be so constructed. A camber of 6mm in all directions, for every 5 meter span, in shuttering for all slabs and beams shall be given to allow for unavoidable sagging, due to self weight (including concrete, workers, machinery etc)/compaction of other causes.

B.4.2.3. Temporary openings or windows shall be provided at the base of column forms, and at other points, where necessary to facilitate cleaning and observation, immediately before concrete is deposited. These shall be properly closed, before placing concrete in position.

B.4.2.4. **Vertical centering/staging:**

The vertical shuttering shall be carried down to such solid surface as is sufficiently strong to afford adequate support and shall remain in position until the newly constructed work is able to support itself. Props

shall be steel tubes with extension pieces and securely braced against lateral displacement. The spacing of steel tubes shall be designed to carry loads imposed on it without undue deflection of the members, supported by the props. The spacing and sizes of props shall be approved by the Architect & Employer and any alterations suggested by them shall be carried out at contractor's expense. Pipe bracing shall be provided, as required/directed, without extra cost. The contractor shall allow in his rates for providing props and struts upto any height as shown in the working drawings issued to the contractor from time to time. Wooden props and bracing can only be allowed under special sanction of the Architect & Employer.

B.4.2. Design of form work:

- i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.
- ii) The form work shall be so designed that the sides of the beams can be first struck, leaving the soffit of beams and the support props in position. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete.
- iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.3. Water tightness:

It is the contractor's responsibility to ensure that the forms are checked for water tightness during progress of shuttering work and also just before concreting operation starts and to make good deficiencies, if any. If instructed by the Architect & Employer, building paper will have to be used, without any extra charge for the same, viz., to have adequate water tightness.

B.4.4. Cleaning and treatment of forms:

All rubbish, particularly chippings, shavings and saw dust, etc., shall be removed from the interior of the forms, before the reinforcement is placed in position and as well before the concrete is placed. The form work to be in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition before placing concrete. Care shall be taken that such approved composition is kept out of contact with reinforcements. Interior of all moulds and boxes must be thoroughly

washed (water) with hose pipe or otherwise so as to be perfectly clean and free from all extraneous matter before depositing of concrete. Prior approval of the form work should be obtained from Architect/Employer, before placing reinforcement on the form work.

B.4.5. Stripping:

Form shall be left in place until their removal is authorised by the Architect & Employer and shall then be removed with due care, so as to avoid injury to concrete and or workmen. In no circumstances the forms shall be struck, until the concrete develops a strength of at least twice the stress, to which the concrete may be subjected to at the time of striking. The strength referred to shall be that of concrete, using the same cement and aggregates with the same proportions, and cured under conditions of temperature and moisture similar to these existing on the work. Where possible, the form work should be left longer, as it would assist in more effective curing.

B.4.6. Stripping time:

In normal circumstances (general where temperatures are above 20 degrees C and where ordinary Portland cement is used) forms shall be struck after expiry of the following periods, unless otherwise specifically directed at site by the Architect & Employer.

		STRIKING TIME IN CLEAR DAYS (OPC) (AFTER THE DAY OF CASTING)
LOCATION		
a.	Vertical sides of walls slabs, beams and columns	4
b.	Bottoms of slabs upto 4.5m span.	7
c.	Bottom of slabs above 4.5m span/ bottoms of beams & arch rib bottoms upto 6m span.	14
d.	Bottom of beams over 6m span and arch rib bottoms above 6m span.	21

B.4.7. Form work in lifts for continuous surfaces:

Where forms for continuous surface are placed in successive units, (as for example in columns or walls) the forms shall fit tightly over the

completed surface so as to prevent any leakage of water/mortar from the concrete and to maintain accurate alignment of the surface.

B.4.8. Procedure while removing the form work:

All formwork shall be removed without shock or vibration, as otherwise it would damage the reinforced concrete. Before the soffit and struts are removed, the concrete surface shall be first exposed partly, where necessary, in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occur with cement, in cold weather. Wetting the surface before stripping is preferable, to avoid spalling of corners.

B.4.9. In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor below the top most floor already cast. The rate quoted for reinforced concrete items is deemed to have included for these arrangements/supports.

B.4.10. Tolerance:

- a. All RCC work shall be executed to true lines and levels and plumb and to the final approval of Architect & Employer's representative.
- b. If work is not carried out within the reasonable tolerance the cost of all rectification measures of dismantling and reconstructing or as decided by the architect and Employer shall be borne by the Contractor. In case of work dismantled, the same will not be measured and paid for.

B.5.1. Concrete mix proportioning:

Concrete mix proportioning for all grades of concrete shall be as per IS 456 - 2000 clauses 8 & 9 and as per SP 23 - 1982 Section 6. The constituent materials to be used for concrete making namely cement, aggregates & water shall be as per clause 4 of IS 456 - 2000. The mix proportions shall be so selected as to ensure that the workability of the fresh concrete is appropriate/suitable for the conditions of handling and placing, so that after compaction its surrounds all reinforcements and completely fills the form work. When concrete is hardened, it shall have the required strength, durability and surface finish. The determination of the proportions of Cement, Aggregates and water to attain the required strengths shall be made as follows:

- a. By adopting nominal concrete mix, which is called 'nominal mix concrete'.

Batching:

In proportioning concrete the quantity of both cement and aggregate should be determined by mass. The mass of cement can be determined on the basis of mass of cement per bag. Water shall be measured by volume in calibrated containers/tanks or weighed.

In case of design mix of concrete, uniformity of the materials used for the concrete making has been established over a period of time, the proportioning may be done subsequently by volume batching, provided prior approval of Architect & Employer is obtained for same and ensured that periodic checks are made on mass/volume relationships of materials. Where weigh batching is adopted, allowance shall be made for bulking in accordance with IS 2386 (part III) 1963.

The concrete shall be mixed in a Mechanical Mixer as per IS 4791 - 1968. Workability of the concrete should be controlled by direct measurement of water content. Workability should be checked at frequent intervals as per IS 1199 - 1959. The contractor is entirely responsible for the proportioning of concrete mixes of required strengths and must submit the procedure for such proportioning of concrete mixes for the prior approval of Employer & Architect, whose decision shall be final in the matter.

- b. Alternatively, contractor may use suitable ready mix concrete at no extra cost and after obtaining written permission from Architects/Bank.

B.5.2. Transporting and placing concrete:

- B.5.2.1. Immediately prior to placing the concrete, the shuttering shall be well watered and any water and rubbish lying removed.
- B.5.2.2. The concrete shall be transported from mixer to the position of placing as rapidly as possible and in a manner that would prevent separation or bleeding or impair the quality of concrete. Equipment for transportation, pumping or pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end, and without any separation of the materials. The chute shall be of metal or metal-lined wood with slopes neither less than 1 vertical to 3 horizontal nor more than 1:2. The discharge end of the chute shall be provided with baffle plates to prevent segregation.

- B.5.2.3. Concrete shall not be dropped from a height in a manner, which will cause segregation. It shall be placed directly in its permanent position to avoid segregation due to rehandling. Rate of placing concrete shall be such as to avoid formation of planes of weakness in concrete being placed. No partly set or retempered concrete shall be used on the job.
- B.5.2.4. Each layer of concrete being placed shall be consolidated by mechanical vibration supplemented by hand spreading, rodding and tamping as directed, to form dense concrete with all surfaces free from honeycombing and tolerably free from water and air holes or other blemishes. Vibrators shall in no case be used to work along the forms. Duration of vibration shall be so limited to reduce time necessary for satisfactory consolidation, without causing objectionable segregation. The vibrator shall not be inserted into a lower course, that has already been vibrated/compacted and begun to set.
- B.5.2.5. The contractor shall be responsible for the co-ordination with sub-contractors or other contractors for incorporating necessary inserts, electrical conduit pipes, fixing boxes, blocks, chase holes, etc., as required. The contractor shall obtain approval from the Architect/Client as regards the above, before casting of the concrete. No holes or chases shall be made in the concrete, without prior approval of the Architect & Employer.
- B.5.2.6. Concrete shall be placed continuously until completion of the work.
- B.5.2.7. Accumulation of set concrete on the reinforcement shall be avoided. Before fresh concrete is deposited upon or against any concrete which has already hardened, the surface of the hardened concrete shall be well roughened, if necessary by chipping, and all lattence removed. The surface shall then be swept clean with wire brushes, thoroughly wetted and covered with a thin layer of rich cement mortar and or chemical additives, as may be directed by Architects.
- B.5.2.8. In foundation trenches or in like positions, concrete shall be carefully laid and poured from less than over 1 meter height. If the height exceeds 1 meter, the concrete must be deposited through inclined spouts. The trenches shall be maintained free of water during concreting by proper diversion of water flow with dewatering as required and directed, at no cost and without washing over freshly deposited concrete.
- B.5.2.9. Concrete footing shall be placed upon undisturbed clean and hard surfaces of specified bearing capacity.
- B.5.2.10. Contractor's authorised Engineers/Supervisors/Foremen shall always be present for all concreting work carried out at site.

B.5.3. Protection of Concrete:

Newly placed concrete shall be protected by approved means from rain, sun and drying winds. Exposed vertical/inclined/curved faces of concrete shall be kept wet continuously for not less than a fortnight by covering with a layer of sack curing, invariably horizontal surfaces shall be kept covered with water ponded by means of bunds. Concrete placed below the ground shall be protected from falling earth during and after placing. Approved means shall be taken to protect immature concrete from damage due to debris, excessive loading, vibration, abrasion, ground-water, mixing with earth or other materials, flotation and other influences that may impair the strength and durability of the concrete.

B.5.4. Consistency:

Only minimum and sufficient water shall be added to the cement and aggregate during the mixing to produce a concrete having sufficient workability to enable it to be well consolidated and to be worked into the corners of the shuttering and around reinforcement, to give the specified surface finish, and to have the specified strength. When suitable and appropriate amount of water has been determined, the resultant consistency shall be maintained through the corresponding parts of the work and approved tests shall be conducted from time to time to ensure the maintenance of this consistency.

The exact determination of the slump for various members and water cement ratio shall be as directed by the Architect & Employer.

Slumps tests shall be made in accordance with the details given in IS 456 - 1978.

B.5.5. Finishing:

B.5.5.1. As soon as possible after the form work has been struck holes left by clamping bolts, air and water holes and other rough patches shall be filled in with cement and sand mortar 1:1 mix (sand passing 1/8" sieve) by working into the surface with a wooden float. Excess water shall be avoided. This should be done within 72 hours after removal of form work.

B.5.5.2. Unless instructed to the contrary the face of exposed concrete placed against shuttering shall be rubbed down immediately upon removal of the shuttering to remove fine or other irregularities. All surfaces which are required to be plastered shall be hacked properly.

B.5.5.3. All exposed faces of concrete members for which shuttering is not provided, shall be smoothened with a wooden float, when the concrete is green and setting has not started, to give a finish equal to that of rubbed down face where shuttering is provided. The top face of a slab, which is not intended to be covered with other materials, shall be levelled and floated while unset to a smooth finish to the levels of falls/slopes shown on the drawings or as instructed. The floating shall be done so as not to bring an excess of mortar to the surface of the concrete. Dentations in the surface of the concrete shall be formed, if specified/ordered, by approved implements to the depths and patterns described. The top face of a slab intended to be surfaces with mortar, granolithic or any other materials shall be finished rough (to receive final finish) and to the approval of the Architect & Employer.

B.5.5.4 Honey Combing:

- i) Where honey combed surfaces are noticed in the concrete, the contractor shall not patch up the same, until examined by the Architect & Employer and decision given regarding accepting the work with rectifications or rejections of the same. If the contractor patches up such defects without the knowledge of the Architect & Employer, the Architect & Employer will be at liberty to order demolition of the concerned concrete members to the extent they consider necessary. In such cases, the contractor shall reconstruct the demolished work. The cost of demolition and demolished work and disposal of debris shall not be measured and paid for.
- ii) If in the opinion of the Architect & Employer the honey combing is harmful to the structure and where so directed by the Architect & Employer, the full structural members affected by honey combing, as decided by Architect & Employer, shall be dismantled and reconstructed to Architect & Employer's approval. The cost of demolished concrete and as well cost of demolishing and disposing the debris will not be measured and paid for.
- iii) Where in the opinion of the Architect & Employer the structural members containing honey combing can be allowed to be retained with rectification, the rectification shall be carried out as directed by the Architect & Employer by gunitting (with cement mortar 1:3 proportion) or epoxy bonding and plastering the areas concerned at the contractor's expense.
- iv) If such honey combed areas are not severe in the opinion of the Architect & Employer and where so directed shall be patched up with dry-pack cement mortar consisting of 1 part of cement and 3 parts of sand after removing defective concrete down to sound concrete to the

satisfaction of Architect & Employer all at the expense of the contractor. Such works should be completed within 72 hours from deshuttering.

- v) Concrete faces to be finally concealed shall be left as from the shuttering, except that honey combed surface shall be treated as above (i), (ii), (iii) & (iv). Faces of concrete that are to have finished other than specified shall be prepared in an approved manner and as instructed.
- vi) The patched up areas shall be kept moist for 7 days and prevented from drying out too soon. Wherever required or instructed by the Architect & Employer, patching work shall be done using part white cement upto 30% of the total quantity of cement specified.

B.5.6. Construction joints:

Concreting shall be carried out continuously upto construction joints, if any, the position and details of which shall be predetermined by the Architects/Employers. Construction joints shall be provided as directed by the Architect. They shall be rebated and or of an approved shape for slabs, beams etc., and shall be provided in the positions described on the drawings or as directed by the Architects/Employer. Inclined "Feather" joints shall not be permitted. Shear keys not less than 2" deep and equal to 50% of the cross sectional area shall be provided to all construction joints. Reinforcing bars shall extend by not less than 60 times dia of respective bars for M:150, 50 times dia, for M:200, beyond construction joints, unless otherwise indicated.

The joints shall be kept only at places, where the shear force is minimum and these shall be at right angles to the direction of main reinforcement. In case of columns, the joints shall be horizontal and about 3" below the bottom of the deepest beam framing into the columns.

B.5.7. Structural joints:

Expansion joints, construction joints, hinges or other permanent structural joints shall be provided in the position and of the form described in the drawings or as directed by the Architects/Employers and shall be got approved before casting.

In no case shall the reinforcement corner protecting angles or other fixed metal items, embedded in or bonded into concrete, run continuously through the expansion joints. The placing of concrete on either side of the expansion joint shall be separated by suitable filler materials during continuous construction or alternately adequate space left during

construction and filler materials placed in position later after an interval of atleast seven days.

B.5.8. **Cutting into concrete:**

No concrete shall be neither cut into, nor shall it be interfered with in any way, without the prior approval in writing by the Architect & Employer.

B.5.9. No portion of the structure shall be subjected to any loading in excess of design loads, except with prior written permission of Architect.

B.6.0. **Strength of Concrete:**

B.6.1. The concrete mix shall be so made to produce the desired grade concrete having the required workability and characteristic strength not less than values given below:

Grade Definition	Specified Minimum Characteristic compressive strength at 28 days
M - 15	150 Kg/Sq.cm
M - 20	200 Kg/Sq.cm
M - 25	250 Kg/Sq.cm
M - 30	300 Kg/Sq.cm

Strength of concrete required for various situations have been clearly stipulated in the relevant item of the schedule of quantities and/or in the drawings. As required by the Architect, the water content and the water/cement ratio shall be determined from the results of tests of the materials proposed for use, in advance of construction. It is important to maintain constant water cement ratio at its correct value.

If the concrete produced at site does not satisfy the above strength requirements, the Architect & Employer will reserve the right to require

the contractor to improve the method of batching, the quality of the ingredients and the mix with increased cement contents, if necessary. The contractor shall not be entitled to claim any extra cost for the extra cement used or for the modifications, for fulfilling the strength requirements as specified. The able guide for the quality and for durability of concrete. It must also have an adequate cement content and as well a low water – cement ration, as given below, which is applicable for moderate weather conditions, as specified in I.S. 456 – 2000.

MINIMUM CEMENT CONTENT	MAXIMUM WATER - CEMENT RATIO
Moderate conditions 290 Kg/Cum	0.55

The minimum cement contents is based on 20mm aggregates. For 40mm aggregate it should be reduced by about 10% and for 12.5mm aggregate it should be increased by about 10%.

B.6.2. Strength tests during the work:

Samples should be taken from each 20 cum of concrete made during the progress of the work, or when a day's concrete work does not amount to 20 cum, then from each day's quota, and as required by Architects/Employers. Six samples of cubes of size 150 x 150 x 150mm shall be taken jointly each time in steel moulds, 3 of which shall be tested for 7 days strength and the remaining 3 shall be tested for 28 days strength on 7th and 28th day respectively, after the day of casting. Proper curing arrangements, as directed by Employers/Architects, shall be made at site by the contractor. Each cube shall be marked and numbered, and dated by the contractor.

The contractor shall maintain a register at site as directed by the Architect Employer, showing all particulars (date of casting, mix of concrete, location of concreting, water cement ratios, approximate concrete quantity represented by samples, no of cubes cast, date and results of testing, and remarks) and all the entries should be signed jointly by the contractor with Architect & Employer. 7 days strength shall not be less than 2/3rds of the 28 days strength. The results of the

tests in any of the recognised laboratories and/or contractor's laboratory at site shall be taken as final and binding on the contractor. The average strength shall be higher than the prescribed strength. The average strength of the specimens taken at a time, may be assumed as the compressive strength of concrete, provided the difference between the maximum and minimum strength of the three specimens does not exceed 15% of the average strength. Concrete test cubes shall be taken out and got tested as per time schedule for knowing 7 days and 28 days crushing strength, at no extra cost, either at site or at an approved laboratory. Whenever for any set of cubes, if the 7 days crushing strength is found satisfactory, 28 days tests are not necessary. In cases, where 7 days strength is not satisfactory, tests for 28 days strength must be gone done WITHOUT ANY EXCEPTION.

In case the compressive strength obtained from the test samples of concrete at 28 days is less than the minimum specified characteristic compressive strength, the work is liable to be rejected at the sole discretion of Architect & Employer.

Employer's & Architect's decision regarding dismantling of such works or suitable rectifications or any alternative assessment by load test for allowing the corresponding work to be retained, shall be final and binding on the contractor. These shall be carried out at contractor's cost only. The condition of any test does not guarantee acceptance of concrete covered by the test final decision regarding finally accepting/rejecting such works even after conducting those tests shall be made by the Architect & Employer only.

In case of concrete showing test results lower than the specified strength and in the opinion of the Architect & Employer such works could be allowed to remain, after due and satisfactory rectifications, if any, ordered and or load tests or even otherwise, then the rates quoted by the contractor, corresponding to those items, shall be reduced suitably for paying for that part of work. The Employer/Architect shall have full power in their absolute discretion to fix the actual rate payable after deduction, and it shall be binding on the contractor. If the strength is so low that in the opinion of Architect & Employer, the work has to be dismantled, then the contractor shall do so as directed at his own cost irrespective of the amount of loss, inconvenience and difficulties involved. Rejected/dismantled work shall not be paid for.

If in the opinion of the Architect & Employer/Engineer any load test or hammer test or any other test is necessary, the same shall be carried out by the contractor as directed and he shall bear the cost of the same. Based on the results of the tests, the Architect shall reduce rates/accept

after rectification or modification/reject and order dismantling of concrete, and the decision shall be final and binding on the contractor.

The contractor shall pay all costs incurred in supplying the material for and in making, maturing, delivering and testing the cubes.

B.7. RECORD OF CONCRETING:

B.7.1 The contractor shall keep a daily record showing the date when each portion of concrete is poured in slab, beam, column footing etc., curing period, removal of formwork and test cubes results at 7 days and 28 days period and observations on the same.

B.8. The rates for concrete shall also include, apart from any other factors specified elsewhere in the tender, as follows:

B.8.1. All materials required for design/ nominal mix concrete, getting the designs for the design mix from an approved agency, labour, use of tools and plants, scaffolding, mixing, conveying, placing, ramming, vibrating, formwork, finishing, curing, hacking etc., complete as required and directed.

B.8.2. Rates for concrete items shall cover

- a. Any shape and size, and for doing at any height and depth (all lifts) as per drawings, providing cover blocks or nylon spacers etc.
- b. Fixing all inserts such as pipes, plugs, forming holes/pockets etc.
- c. Providing dowel bars, etc., through shuttering and forming drip molds to chajjas, sills etc., or at any other places as directed.

B.9.0 MODE OF MEASUREMENT:

B.9.1. Length of columns will be measured upto top of the slab.

B.9.2. Length of main beams will be measured between columns and depth below the top of the slab. For secondary beams length will be between main beams.

B.9.3. Slabs to be measured in Cum between beam to beam.

B.9.4. Chajjas will be measured in CUM. Width to be measured beyond lintel width.

B.9.5. For staircase, RCC steps, waist slab, beams will be measured in Cum.

B.10. **PRECAST CONCRETE:**

B.10.1. All provisions in the specifications for concrete shall apply to precast concrete except for the specific variations given herein below:

B.10.2. **Aggregate:**

For maximum size of aggregate shall not be larger than one third of the minimum dimension of the member.

B.10.3. **Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

B.10.3. **Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

B.10.4. **Care:**

The concrete in one precast piece shall be placed in one operation. No piece shall be removed from the mould or erected until sufficiently natured to ensure that no damage may occur to the piece.

B.10.5. **Details:**

All details of jointing, inserts, anchors and bearing widths etc., shall be as shown in the drawings.

B.10.6. **Identification and Marking:**

All precast concrete members shall be properly marked to indicate the top of the member and its location.

B.10.7 **Transportation, Storage and Erection:**

While handling, including loading/unloading, the members shall be supported/hung at such suitable points, so that the member may safely withstand all the loads/stresses etc., that may occur/develop. For this,

suitable hooks/markings etc., shall be provided, while casting itself, as may be necessary and or as directed.

B.10.7.1. Units shall be stored, transported and placed so that they will not be over stressed/pressed or damaged.

B.10.7.2. Precast concrete units shall be adequately braced and supported during erection to ensure proper alignment and safety and such bracing and supports shall be maintained until there are adequate permanent connections.

C. **MASONRY:**

C.1. **BRICK MASONRY:**

C.1.1. **Bricks:**

- a. The bricks shall be of best locally available quality, and having the specified crushing strength, and shall be of quality approved by the Employer & Architect before placing orders for the same.
- b. They shall be sound, hard and well burnt. They must give a ringing sound when struck with a metal piece and shall have frog.
- c. They shall be free from cracks, flaws and nodules and also free from lime or stone pieces.
- d. All bricks when dry, shall have an average compressive strength not less than 35 Kg/Sqcm, unless otherwise specified.
- e. The bricks wherever specified as wire cut and or machine made, shall have compressive strength not less than 75 Kg/sq.cm, unless otherwise specified. The crushing strength bricks of bricks which vary by more than 15% of average strength of that group of sample, must be omitted and average strength of balance bricks only shall be considered as representative of that lot of bricks.
- f. The contractor shall produce different brands of locally available bricks for approval by the Employer & Architect. If during the execution of the work, it is observed that the bricks of approved brand/quality are not sufficient in quantity or Manufacturer's have not maintained the same approved quality, then the contractor shall make alternate arrangements to procure bricks from any other source even with longer leads without any extra cost, after getting same approved in advance by the Architect & Employer, as done earlier.

- g. If the contractor executes the work, without approved quality of bricks, the same shall be liable for rejection or paid at reduced rates, at the sole discretion of the Employer & Architect, which shall be final and binding.

C.1.2. **Mortar:**

The sand should be only of approved quality and 'Coarse' unless otherwise specified. It will be screened and/or washed, if required and directed, without extra cost. Unless otherwise stated, cement mortar for brick work shall be of 1:6 (1 cement : 6 sand) proportion for walls of one brick thick and above. While for half brick walls or brick on edge work cement mortar shall be of 1:4 (1 cement :4 sand) proportion.

C.2. **WORKMANSHIP:**

C.2.1. **Proportion and mixing of cement mortar:**

Cement and sand shall be mixed in the specified proportion by volume by emptying cement bags on measured quantity of sand and thoroughly turning over the mixture in a dry state, till uniform colour is obtained. The mixture is made into the form of a frustrum of a cone with a hollow at top centre, and then water added to it. The whole material is then thoroughly turned and mixed till mortar is homogeneous; and shall be mixed only for such quantities, which can be readily used. Not more than 30 minutes should pass between adding of water to the dry mixture and the actual placings of mortar in position.

C.2.2. **Construction:**

- C.2.2.1. All brick work shall be set out and built to lines, levels, batters, curves and to any shape or position to dimensions, thickness and heights shown upon the drawings, and a good bond shall be preserved throughout the work both laterally and transversly. English bond shall be used throughout.
- C.2.2.2. All bricks shall be thoroughly wetted before use in the manner that water penetrates to the full depth of brick stock, and every brick is fully soaked.
- C.2.2.3. Single or double scaffolding of adequate strength shall be provided for all types of loads likely to come on them during construction. In case of single scaffoldings all the scaffolding holes shall finally be filled with cement concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate, 20mm nominal size) at contractor's cost.

- C.2.2.4. All courses shall be laid truly horizontal and all vertical joints made truly vertical.
- C.2.2.5. Where water is met within foundations, work space shall be kept free of water by the contractor while the brick work is in progress and until the mortar, pointing, plastering have properly set.
- C.2.2.6. No half or quarter brick shall be used except as closures. The closures shall be horizontal and the walls shall be raised plumb. Not more than ten courses shall be raised in a day and no part of the work shall be raised more than one meter above another at any time.
- C.2.2.7. Joints shall be uniform in thickness. All joints shall be adjusted to its final position in the wall while the mortar is steel soft and plastic. All vertical joints shall be full of mortar and well compacted with trowel and just sufficient water (so that cement/mortar does not flow out of the joints). No looseness/hollows in the mortar (in the joints) shall be permitted. Any unit, which is disturbed after mortar has stiffened or the mortar in the joints is loose or has hollows, shall be removed and re laid with fresh mortar.
- C.2.2.8. All joint shall be raked out, while the mortar is still green, to a depth of 10mm (minimum) to ensure a good key for plastering.
- C.2.2.9. Half brick walls shall be reinforced at every 4th bedded course with 25 x 1.5mm hoop iron reinforcement well in mortar, properly lagged etc., and as directed by the Architect. Alternatively two 6mm dia bars be embedded in cement mortar in same locations.
- C.2.2.10. In brick arches or other circular work, the bricks shall be shaped to slope, joints radiating outward and correctly from the center, front to back of walls and joints shall be not more than 12mm thick.
- C.2.2.11. All brick work shall be adequately watered atleast for three times as day, for ten days continuously.
- C.2.2.12. During the rains and frosty weather, the work shall be carefully covered, without extra charge, so as to prevent any mortar being washed away etc. Should any brick work be damaged, the same shall be removed and rebuilt at the contractor's expense.
- C.2.2.13. Chases and raked out joints shall be kept free from mortar or other debris. Spaces around door frames and other built-in items shall be solidly filled with cement mortar 1:3 (1 cement :3 coarse sand) or cement concrete 1:3:6 (1 cement :3 coarse sand : 6 hard stone aggregate of suitable size). Anchors, wall plugs, accessories, flashings and other items

required to be built in with masonry shall be built in as masonry work progresses. Unfinished work shall be stepped back for jointing with new work. Toothing may be resorted to, only when specifically approved by the Architect. Before new work is started, all loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

C.3. **RATES TO INCLUDE:**

Apart from other factors mentioned elsewhere in this contract, the rates for brick masonry shall also include following:

- C.3.1. All materials, labour, tools/equipment used and other items intended for the satisfactory completion of brick masonry at all heights and depths.
- C.3.2. Erecting and removing of all single or double scaffolding, (as may be directed/specified), ladders required for the execution of the work at any height and depth and shape as shown in drawings or as directed by the Architect & Employer, and as well cleaning everyday the surface of masonry executed on that day.
- C.3.3. Cutting of brick work, raking out joints to received plaster, removing stains and mortar lumps, making required chases and openings and filling the chases with cement mortar not leaner than 1:4 (1 cement :4 coarse sand), all as specified/directed.
- C.3.4. Reinforcement embedded in cement mortar, including cost of reinforcement, in half brick walls and brick on edge work.
- C.3.5. Dewatering, wherever required.

C.4 **MODE OF MEASUREMENT:**

All brick work, except half brick work and brick on edge, shall be measured in cubic meters. Half brick and brick on edge will be measured in Sq.meters. Deductions shall be made for all openings, lintels, beams, chajjas/shelves bearings, and the like and columns etc., occupying full thickness of the walls. No deductions will be made for ends only of

- i. Dissimilar materials like girders, beams, lintels, rafters etc., upto 500 Sq.cm. cross section, and for
- ii. Openings upto 0.1 Sq.m. in face area.

D.O. **RUBBLE MASONRY:**

D.1. **MATERIALS:**

D.1.1. **Stones:**

- D.1.1.1. They shall be blue granite stones from an approved quarry.
- D.1.1.2. They shall be tough, hard, dense, durable, sound, uniform in colour and texture and free from flaws, cracks, unjuries, veins, crystals, minerals, salt, cavities, skins (weathered surfaces) and other defects.
- D.1.1.3. The stone shall not absorb water more than 5% of its dry weight, when immersed in water and tested as per I.S. 1224.
- D.1.1.4. The contractor shall furnish a sample of stones which he intends to use on the works and get the same approved by the Architects, well before start of masonry.
- D.1.1.5. All Royalties, Compensations, Taxes, Octroi, duties, etc., payable for securing stones shall be paid by the contractor and included in the rates quoted for respective items.

The mortar shall be as specified in the item or as shown on drawing. The sand shall be coarse and of approved quality and may be screened or washed, if required, without extra cost.

D.2.0. **WORKMANSHIP:**

D.2.1. **Masonry:**

- D.2.1.1. The stones shall be hammer dressed, unless otherwise specified in the item, before they are laid in position. For masonry to be plastered, bushes on surfaces shall not exceed 12mm in thickness and for other (exposed) faces not more than 25mm.
- D.2.1.2. The masonry shall consist of large stones flat bedded, properly selected for their places and carefully laid, with a suitable proportion of smaller stones and chips to fill up the interstices (but not on faces). No face joint shall exceed 20mm and shall also be not less than 10mm in width. The stones shall be wetted before laying in mortar. The work shall be hand set and solidly bedded in and surrounded with mortar fully and properly on every side except the face.
- D.2.1.3. Flat stones shall not be less in breadth than in height and its length shall not be less than 1½ times its height.

- D.2.1.4. Through stones or headers shall be laid in every course at a distance not exceeding 1.0 meter apart and shall be staggered. They shall be in one piece for walls upto 600mm width and shall be lap jointed (laps not less than 150mm) in case of greater thickness, if laps are desired by the contractor. In no case length of these stones shall be less than 400mm. Alternately headers may be of precast cement concrete blocks of cement concrete 1:3:6 (1 cement : 3 coarse sand: 6 hard stone aggregate 20mm nominal size) and in cross section, height shall be equal to the height of that course in the masonry. The face area of each header shall not be less than 0.05 sq.m. They shall be distinctly marked on their face.
- D.2.1.5. Quoins shall have the same height as that of the course. They shall be laid header and stretcher alternatively. Faces of quoins shall be fair dressed. No quoin stone shall be less than 0.03 cum in content. Jambs or doors, windows and openings be formed with quoins only. They shall have uniform chisel draft of 40mm at the corner edges.
- D.2.1.6. The masonry shall be laid to lines, levels, curves, and shapes as shown in the plans. The face of all masonry work shall be strictly in plumb. In the case of battered walls, the courses on the battered surface side shall be at right angles to the batter. All joints shall be raked out to a depth not less than 20mm, and unless otherwise stated shall be flush pointed for all exposed surfaces with cement mortar of proportion (1 cement :3 fine sand). The width of pointing shall be uniform and constant.
- D.2.1.7. The fixtures, plugs, frames etc., if any, shall be built in places as shown on plans, while laying the masonry, and not afterwards, by removing the stones already laid.
- D.2.1.8. Bad work shall be pulled down, as directed by the Architect, and shall be rebuilt at the contractor's cost.
- D.2.1.9. All masonry shall be washed down on completion and all stains and mortar removed from the faces as scaffolding is removed, on each day.
- D.2.1.10. Holes of the required size and shape shall be preferably left during construction alone for fixing pipes, service lines etc. After the pipes are fixed in position the hollows if any, shall be filled in with 1:3 (1 cement : 3 coarse sand) cement mortar or 1:3:6 cement concrete (1 cement: 3 coarse sand: 6 graded stone aggregate 20/12.5mm nominal size as required). The face shall be neatly finished with matching stones. Iron and steel fixtures shall be embedded in cement mortar 1:5 91 cement :5 coarse sand).

D.2.1.11. In wet foundations, work space shall be kept free from water, while the masonry is in progress and until the mortar has sufficiently set.

D.2.1.12. Adequate single/double scaffolding as required and or directed for constructing masonry shall be provided and scaffolding holes filled with cement concrete (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) and finished to have surfaces matching with adjacent stones by the contractor at his expenses.

D.2.2. Coursed Rubble – Stone Masonry – Second Sort:

D.2.2.1. Exposed face stones shall be khandki dressed to have the vertical and horizontal sides perfectly straight, parallel at right angles to the adjacent sides. Where the interior face is to be plastered, the backing stones and hearting shall be as specified for uncoursed rubble masonry, chisel drafts of 37mm dia shall be provided at the external corners, when stone face is not chisel dressed.

D.2.2.2. Height of each course shall not be less than 150mm and all the stones in any course shall be of the same height. Unless otherwise stated, height of all courses shall be uniform. In no case the height of any course shall be more than any of the courses below it. The bed and joints shall be hammer or chisel dressed back from the face for 3" and 1½" width respectively. The faces of the stones shall be hammer dressed and bushings shall not be more than 10mm. Thickness of the joints shall not exceed 10mm. Stones shall break joints atleast half of the height of the course.

D.2.2.3. Quoins shall be atleast 0.5m long (limited to thickness of wall when single piece placed across the jamb), laid square on their levels and beds shall be fair dressed to a depth of atleast 10mm.

D.2.2.4. Face joints shall not exceed 15mm.

D.2.3. Uncoursed Rubble Masonry:

Rubble stones shall be uncoursed blue granite stones from an approved quarry. They shall be tough, hard, dense, durable, sound, uniform in colour and texture and free from flaws, cracks, injuries, veins, crystals, minerals, salts, cavities, skins and other defects.

If ordered by the Architect & Employer, 75 x 75mm or of specified size weep holes shall be provided in the masonry without any extra cost, at spacings as directed by the Architect.

During the progress of the work, if necessary, diversion of the nalla shall be provided and maintained by the Contractor at his own cost.

In wet foundations, work space shall be kept free from water while the masonry is in progress and until the mortar has sufficiently set in. Dewatering shall be done bailing out water or pumping out water by the contractor at his own cost.

Adequate scaffolding required for constructing masonry walls shall be provided by the contractor at his expenses.

Flush cement pointing shall be done in cement mortar 1:3 (1 cement : 3 fine sand) unless otherwise specified. The width of pointing shall be constant and not varying.

Stones shall be hammer dressed. Nearly half the stones shall not be less than 0.01 cum each in content and 25% of stones shall tail back into the masonry by 40mm or more. The stones shall be so arranged to break horizontal joints atleast by 50mm and long vertical joints being carefully avoided.

Cement mortar shall be of (1:6) proportion, unless otherwise specified.

For masonry to be plastered, bushes shall not exceed 12mm, in thickness.

Flat stones shall not be less in breadth than in height and its length shall not be less than 1½ times its height.

The masonry shall consist of large stones flat bedded, properly selected for their places and carefully laid with a suitable proportion of smaller stones and chips to fill up interstices (hearting). The stones shall be wetted before laying in mortar. The whole work shall be hand set and solidly bedded and surrounded well with compacted mortar on all sides, except the face.

Through stones or headers shall be laid in every course at a distance not exceeding 1m. apart and shall be staggered. They shall be in one piece for walls, upto 600mm width and shall lap atleast 150mm for thicker walls. Face area shall not be less than 0.05 Sqm. They shall be distinctly marked less than 400mm. Alternately headers may be of precast cement concrete blocks of cement concrete 1:3:6 (1cement : 3 coarse sand : 6 hard stone aggregate 20mm nominal size) and in cross section, height shall be equal to the height of that course in the masonry.

Quoins shall have same height as courses and shall be laid alternatively header and stretcher. They shall be fair dressed and shall be less than

0.03 cum in content. Jambs of doors, windows and openings shall be formed with quoins. They shall have uniform chisel draft of 40mm at the corner edges.

The masonry shall be laid to lines, curves, levels and shapes as shown in drawings. The face of masonry shall be in plumb. In case of battered walls the courses on the battered side shall be at right angles to the batter.

All face joints shall be raked out for a depth not less than 20mm, and unless otherwise stated, shall be pointed sunk/raised/flush (as may be decided by the Architect) with cement mortar 1:3 (1 cement : 3 fine sand) in case of all exposed surfaces. The pointing shall be of uniform and constant width. The masonry shall be shaded from the sun and watered well for 10 days.

For the days work, all masonry shall be washed down, on completion of days work, of all stains; and mortar splashes removed from the face for the days work and before the scaffolding is removed.

The joints shall be uniform on the face and be not more than 20mm in width.

D.2.4. Random Rubble – First Sort:

D.2.4.1. Stones shall be roughly chisel dressed. They shall be so arranged as to break joints as much as possible, avoiding continuous lines of joints horizontal and vertical. Quoins shall be same as for coursed rubble second sort.

D.2.4.2. All stones shall be carefully fitted with uniform thickness of joints not exceeding 20mm. Face joints shall be chisel dressed for a depth not less than 25mm for fitting in position properly.

D.2.4.3. All other details shall be same as for coursed rubble stone masonry 2nd sort.

D.3.0 MODE OF MEASUREMENT:

Masonry work will be paid in Cu.m. All deductions shall be made specified for brick masonry work.

D.4.0. STORM WATER DRAINAGE:

Storm water drains shall be constructed as per drawings/directions, and on either one or both sides of the road, (unless the land beyond both the

shoulders slopes away adequately), to serve as catch water drains and or for continuing upstream drain. The dimensions and slopes shall be as detailed in the drawings and as required and directed. Bed concrete shall be of P.C.C. 1:3:6 (1 cement : 3 coarse sand :6 hard graded stone aggregate 40mm size) of 150mm thickness. Drains shall be constructed either in rubble masonry or brick masonry as required and shall be plastered in CM 1:6 (1 cement : 6 fine sand) or as specified/directed. The sides of drains may also be of cast-in-situ or precast with cement concrete 1:2:4 (1 cement :2 sand : 4 hard graded stone aggregate 20mm nominal size), if so specified. When the drain is provided by the side of road, adjoining the shoulder necessary stone masonry parapets shall be provided over the drain wall on the road side.

D.5.0. **DRY RUBBLE PITCHING:**

The rubble stones for pitching shall be sound, hard and durable and fairly regular in shape. The average depth of the stones shall be not less than the specified thickness of pitching (and depth of any individual stone shall generally be less by more than 25mm) and each stone shall generally be not less than 0.01 cum or as ordered by the Architect & employer. The smaller size stones shall be brought to site only for the purpose of packing and wedging.

The slopes of the bank shall be made up with morrum and trimmed to the required slope and properly compacted in layers (each not more than 200mm) after adequately watering profile shall be put up with pegs and strings at required intervals for the pitching, to ensure that it is done true to line, curves, levels, thickness and slopes.

Toe wall as shown and directed shall be provided at the toe to support the pitching and shall be measured along with the slope of pitching. The pitching shall be commenced at the toe and laid course by course up the slope. The stones shall be laid closely in position on the prepared bed, and firmly set. The pitching shall be laid to line, levels, curves and slope as indicated in the plans or as ordered by the Architect & Employer. Each stone shall cover the full depth of pitching and shall be perpendicular to the sloping bed. The stones shall be laid with breaking joints as far as possible. Additional morrum, bedding, if required, for proper slope shall be laid out simultaneously, watered and well rammed. The joints between stones shall be filled in with spalls of proper size and wedged in with hammers to ensure tight packing or filled with CM 1:5 (1 cement :5 coarse sand) for depths not less than 75mm or as specified and directed. The item includes repairing disturbed pitching, if any, as and when required and directed.

Flush pointing shall be done in cement mortar 1:3 (1 cement :3 fine sand), if so specified/directed.

E. **CEMENT PLASTERING/CEMENT POINTING:**

E.1.0. **MATERIALS:**

E.1.1. Cement, sand and water constituting the materials for the work shall conform to the specifications laid down for the concrete work. Fine sand shall be used as per IS Code.

E.1.2. Lime required for neeru finish shall be of approved variety fat lime.

E.1.3. Mortar shall be in proportions specified in the bills of quantities.

E.2.0. **WORKMANSHIP:**

E.2.1. **General:**

E.2.1.1. Adequate single scaffolding (if specifically permitted) shall be provided by the contractor at his expense and the scaffolding holes shall be filled in with cement concrete 1:3:6 (1 cement : 3 coarse sand: 6 hard graded stone aggregate 20mm size) compacted well and plastered over before lowering the scaffolding just below, if any, without any extra cost. In case double scaffolding is done, nothing extra shall be paid.

E.2.1.1. Dewatering the foundation if required, shall be done by the contractor at his own cost.

E.2.1.2. The surfaces to be plastered shall be first cleaned and watered well in advance and thoroughly wetted before plastering.

E.2.1.3. Smooth surfaces of concrete, old plaster etc., shall be suitably roughened or removed to provide necessary bond for the plaster. All dirt, spots, oil paint etc., which prevents proper bond with plaster, shall be removed.

E.2.1.4. Patches of plaster 150 x 150mm shall be put on about 3 meter apart as gauges, to ensure even plastering in one plane.

E.2.1.5. All plaster work will be done to lines levels and plumb and to the satisfaction of Architect & Employer.

- E.2.1.6. For walls, columns and beams, thickness will be minimum 20mm for external faces and 15mm thick for internal faces, while for ceiling it shall be average 10mm, unless otherwise specified in bill of quantities.
- E.2.1.7. The thickness specified shall be average and measured from the proudest part of the surface.
- E.2.1.8. Unless otherwise stated in Bill of Quantities, cement mortar shall be in 1:4 (1 cement :4 fine sand) proportion.

E.2.2. **Plaster with Neeru Finish:**

- E.2.2.1. The surface thus rendered shall then be finished with good quality of lime neeru. Neeru may be prepared at site out of the best quality of fat lime slaked at site with fresh water and sifted as specified. The slaked and sifted lime shall be reduced to a fine paste by grinding in a mortar mill (150 turns). Only sufficient quantity which can be used within 10 days only, shall be prepared at a time. Chopped hessain or jute fibre in the required quantity may also be added to neeru, if directed by the Architect & Employer. Otherwise ready madeneeru of approved quality can be used. If required, plastered surfaces should be finished smooth with junction of skirting and plaster, if any, shall be finished as directed at no extra cost. All door/window jambs shall be finished as directed.
- E.2.2.2. Plaster work shall proceed from top to bottom. An entire unobstructed surface shall be plastered in one operation. All exposed angles and junctions of walls and doors etc., shall be carefully flushed so as to furnish a neat and even surface. Before the base coat sets the neeru finish shall be applied and finished smooth. The entire plaster shall be surfaced truly vertical and horizontal. In case thickness item, no extra will be paid to the contractor.
- E.2.2.3. All mouldings as shown on drawings or as directed shall be worked true to the template and drawn neat, clean and level, at no extra cost.
- E.2.2.4. Bad work shall be pulled down as directed by the Architects/clients and shall be rebuilt by the contractor at his cost.
- E.2.2.5. All plaster work shall be cured atleast for 7 days and to the entire satisfaction of the Architect & Employer. The curing shall be so done that damage to plaster with the impact of splashing water is avoided.
- E.2.2.6. The contractor shall be responsible for making good any portion of plaster, which requires redoing, at his cost.

E.2.3. **Rough cast Cement plaster:**

- E.2.3.1. The surface shall be cleaned as specified under cement plaster with neeru finish.
- E.2.3.2. First coat comprising of cement and sand mortar 1:4 (1 cement :4 fine sand) with approved water proofing compound as per manufacturer's instruction, shall be applied uniformly with a trowel and flat board to exact plumb with thickness not less than 15mm and allow it to set for not less than half an hour.
- E.2.3.3. While this is still green, the surface shall be roughened with wire brush. The surface shall be cured for 4 days.
- E.2.3.4. All loose particles shall be dusted and a second coat of average 6mm thick cement mortar 1:3 (1 cement :3 fine sand) shall then be applied. Sand used shall be screened through a mesh not less than 1/16" and not more than 1/8" size and thoroughly washed, if required. The finished surfaces shall be lightly pressed with close pricked wooden board or a wet sponge to bring the sand particles into prominence.
- E.2.3.5. General workmanship, curing etc., shall be all as specified for cement plaster with neeru finish.

E.2.4. **Water proof cement plaster:**

This shall be all as specified herein before for cement plaster work except for the following:

- a) No neeru finish shall be applied over the rendered surface, but the rendered surface itself shall be finished smooth by steel trowelling.
- b) In the preparation of cement sand mortar, cement shall be mixed with an approved waterproofing compound such as pudlo, CICO No.1 water lock, impermo, composeal or of any other standard manufacturer as per the manufacturer's instructions and as directed by the Architects.

E.2.5. **Rate to include:**

Apart from other factors mentioned elsewhere in the contract, rates for plastering shall also include following:

- E.2.5.1. All materials, labour, use of tanks/implements for satisfactory completion of the work.
- E.2.5.2. Erection, dismantling and removing single/ double scaffolding.

- E.2.5.3. Preparing all the surfaces to secure plaster.
- E.2.5.4. Providing cement plaster of specified average thickness (measured from the proudest part of BB/stone work) and proportion at all heights and depths and to any shape as directed.
- E.2.5.5. Curing for 7 days.
- E.2.5.6. Chicken mesh of approved gauge shall be provided at all the junctions of concrete, masonry, timber and grouting of chases made for electrical/plumbing or other purpose as directed at no extra cost. Prover V-grooves must be made at all junctions of walls and slabs/beams/columns etc., at no extra cost.
- E.2.5.7. Any moulding, bends, arisers, gooves/drip mould, rounding/Vatas, chamfering, soffits of arches, and also making good damaged plaster after their (Contractor's) all the sub contractor or nominated sub contractors have done their work.

E.2.6. **Mode of Measurement:**

All plastering will be measured in square metre, unless otherwise described, as per relevant I.S. code.

Walls:

The measurement of walls plastering shall be taken between the walls or partitions for the length and from top of floor or skirting upto the ceiling bottom for the height. The dimensions before plastering shall be taken.

Ceiling:

Ceiling shall be measured between walls or partitions and the dimensions before plastering shall be taken. Ceilings with projected beams shall be measured over beam and the plastered side of the beam shall be measured and added to plastering on ceiling.

For jambs, soffits, sills, etc., for openings not exceeding 0.5 sq.m. each in area, ends of joists, beams, posts, girders, steps etc., not exceeding 0.5 sq.m each in area and openings not exceeding 3 sq.m each., deductions and additions shall be made in the following manner.

- E.2.6.1. No deduction shall be made for ends of joists, beams posts etc., and openings, not exceeding 0.5 sq.m. each, and no addition shall be made for

reveals, jambs, soffits, sills, etc., of these openings no for finishing the plaster around ends of joists, beams, posts, etc.

E.2.6.2. Deductions for openings exceeding 0.50 sqm but not exceeding 3 sqm each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills, etc., of these openings.

E.2.6.3. Deductions for openings exceeding 0.50 sqm but not exceeding 3 sqm each shall be made as follows and no additions shall be made for reveals, jambs, soffits, sills, etc., of these openings.

When both faces of wall are plastered with the same plaster, deduction shall be made for one face only.

When two faces of wall are plastered with different plasters or if one face is plastered and the other pointed, deduction shall be made from the plaster or pointing, on the side of frames for doors, windows, etc., on which the width of reveals is less than that on the other side, but not deduction shall be made on other side.

E.2.6.4. In case of openings of area above 3 sq.m each, deductions shall be made for the openings, but jambs, soffits and sills shall be measured.

E.3.0. **CEMENT POINTING:**

E.3.1. **Materials:**

E.3.1.1. Cement, sand and water shall conform to the specifications laid down for the concrete work, fine sand to be used as per ISI code.

E.3.2. **Workmanship:**

E.3.2.1. Dust and mortar powder shall be brushed out of all joints. The surface shall then be washed with water and kept wet before pointing is commenced.

E.3.2.2. In case of dry rubble pitching, the cement mortar 1:4 (1 cement: 4 sand) proportion shall be well pressed into the joints with a pointed trowel and rubbed smooth. It shall not be spread over the corners, edges and face of the masonry. All superfluous mortar, if any, shall be removed, with a trowel. All joints shall be generally uniform in size.

E.3.2.3. The pointing shall be kept wet for atleast ten days. It shall be suitably protected from sun, rain and other factors during the period of curing.

E.4. **Mode of Measurement:**

Pointing work shall be measured in Sq.meters. Deductions for openings exceeding 0.5 sq.m. will be made, same as for plaster.

F. FLOORING:

F.5. GRANITE FLOORING SKIRTING AND FACING:

F.5.1. Materials:

F.5.1.1. Granite stone slabs shall of the thickness and type mentioned in the item and of the colour and quality approved by the Architects. Slabs shall be hard, dense, uniform and homogeneous in texture. They shall have even crystallized grain and be free from defects and cracks. The surface shall be mirror polished to an even and perfectly plain surface and edge machine cut, true and square.

F.5.1.2. No slab shall be thinner than the specified thickness, at its thinnest part. The dimensions of the slab shall be as specified in the item. A few specimens of approved finished slabs shall be deposited by the Contractor in the Architect's office for reference.

F.5.1.3. All the Granite slabs brought to site shall be got approved by the Architect & Employer, before using them in the work. Sizes of Granite slabs for floorings, steps/raisers and dado etc., shall be got approved by Architect & Employer, before ordering for the same.

F.5.2. Workmanship:

F.5.2.1 They shall be laid to the pattern shown in the drawings or as directed by the Architects.

F.5.2.2. The surface on which the Granite slabs are to be laid shall be cleaned of all dust and saturated with water.

F.5.2.3. The Granite slabs shall be set in cement slurry over cement mortar bedding as specified and tamped with wooden mallet. The joints shall not exceed 1mm. In thickness and shall be grouted/flushed with white cement mixed with pigment of suitable colour, if required, to match the shade/colour of slabs, and cured for 10 days.

F.6. GLAZED TILE IN FLOORS, DADOS & SKIRTING:

F.6.1. Materials:

F.6.1.1. glazed tiles shall be of first quality and of approved make and 5.5 mm in thickness. They shall be sound, hard and well and evenly glazed with fine and sharp edges, and free from twists. The rear face shall be

grooved and recessed or suitably moulded, in parts, to provide necessary key for mortar. They shall generally conform to I.S.777:1988 (Second revision). The tiles shall be of sizes 150mm x 150mm or 100mm x 100mm or as specified/directed.

F.6.2. **Workmanship:**

F.6.2.1. The tiles to be used for floor and dado shall be of the same manufacture and of first quality, as per approved sample.

F.6.2.2. Tiles shall be immersed in water for atleast 6 hours prior to their end use.

F.6.2.3. Cement sand mortar 1:4 (1 cement :4 coarse sand) bed (average 20mm thick for flooring and 12mm thick for skirting finished to proper levels and falls. After the surface has hardened sufficiently, it shall be roughened, cleaned and well set to receive a thin cement slurry of honey like consistency. Tiles with their under side also smeared with cement slurry of honey like consistency shall then be laid over the bedding and tamped into position properly to have the top surfaces in a true plane and level or to falls as directed.

F.6.2.4. For skirting/dado, the surfaces shall be plastered with cement mortar 1:4 (1 cement : 4 coarse sand) to make the surface even and in plumb. The surface of the plaster shall be scarified with brush for getting a good bond between the back of the tiles shall be battered with cement paste and pressed on the plastered surface as per flooring and tapped in position.

F.6.2.5. Joints shall be thin, uniform, even and straight. The joints shall be cleaned off gray cement and pointed with white cement paste with pigment, if required, to match the shade of the tiles. The work shall be cured for 7 days. After curing, the surface shall be washed clean with water and oxalic acid. The finished floor skirting/dadoo shall not sound hollow, when tapped with a wooden mallet.

F.6.3. **MODE OF MEASUREMENT:**

All flooring work will be measured in Sq.metre basis and shall be measured between unplastered wall surfaces. Skirting and dado will be measured in Sq.meters and the height above flooring will be measured, length between the finishes of adjoining walls, if any.

F.7. The ceramic flooring shall be of first quality and of approved make and 7.5mm in thickness. They shall be sound, hard and tough as per manufacturers specification. The rear face shall be groove and recessed

or) suitably manholed in part to provide necessary key for mortar. The tiles shall be of sizes 12" x 12", 8" x 8" (or) as specified/directed.

G. **WOOD WORK:**

G.1. **MATERIALS:**

G.1.1. Unless otherwise stated the timber used in this project will be second class teakwood and shall be got approved from the Employer & Architect before using it in work. The timber shall be well seasoned and free from shakes, fissures, cracks, large/loose knots or other major defects. It shall also be free from spongy, brittle, flaky wood, sapwood and all such defects, which will affect its strength, durability, appearance or usefulness for the purpose for which it is required. Any effort such as plugging, painting or using any adhesives, to hide any defects, shall render the timber liable to rejection by the Employer & Architect. No individual hard and sound knot shall be more than 40mm dia and the aggregate area of all the knots shall not exceed 1.5% of area of the piece for purposes of acceptance. It should confirm to relevant I.S.I003.

G.1.2. Any timber rejected for any reason whatsoever, shall at once be removed from the site of work.

G.1.3. Glue: Organic type shall comply with specification I.S. 852 -1957 and synthetic type shall comply with I.S.851 - 1957 in all respects.

G.1.4. Nails, screws, ties, straps, bolts, etc., shall be of the material, make and pattern as approved by the Architect. Unless otherwise specified, they must be of mild steel and be of such sections and design, such that they serve the purpose adequately.

G.1.5. The Contractor shall get all the wood approved by Architect & Employer, before taking permission of the Architect to apply paints, oils or otherwise treats wood work in anyway whatsoever.

G.1.6. All embedded parts of wood work shall be well painted with two coats of hot boiled tar or creosoted, as approved by the Architects/Employers.

G.2. **WORKMANSHIP:**

G.2.1. All the wood work shall be neatly and truly finished as per tender item dimensions with not more than 3mm, planning margin. Unless otherwise specified, the exposed wood work shall be accurately planned to the required dimensions, within planning tolerance, smooth and to lines, planes, curves or shapes as required.

- G.2.2. All the necessary joinery work shall be carefully done as per normal standard practice and Architects instructions. All framed joinery for external work shall be put together with white lead and joints pinned with hardwood or Fevicol. For internal work, unaffected by moisture, the joints may be glued and pinned or joined with fevicol as directed.
- G.2.3. Framed/Fabricated wood work includes all sawing, cutting, planing, jointing, framing, supply and use of all straps, bolts, holdfasts, nauts, trensils, spikes, screws, etc., as may be necessary to complete the work and for fabricating/framing and or fixing. Fabricating/framing and trussing shall be done in the best possible manner and as shown on the drawings or as directed by the Architects/Employers.
- G.2.4. The contractor shall provide labour, scaffolding, ladders and tackle necessary for hoisting and fixing wood work in position and afford facilities for its inspection during construction. The contractor shall be responsible for the safety of the work, workmen and for any action or compensation that may arise in this connection.
- G.2.5. All iron work connected with wood work and going to be embedded in masonry shall, before erection, receive 2 coats of solignum/creosote. If it is to be painted, it shall be given one coat of red oxide primer and one coat of finishing paind on the ground, before being fixed in position and afterwards second coat of finishing paint.
- G.2.6. All wood shall be got inspected and passed by the Architect & Employer before being put into work. The architect defective quality, despite his having previously passed the same before it was worked upon. In no case the wood work shall be painted or otherwise, before it is inspected and approved by the Architect.
- G.2.7. After fixing the wood work in position, if any defects, including damaged edges of the frames, are notices by the Architect & Employer during the execution of work or in the defects liability period, the contractor shall have to rectify the same or remove and replace the defective work, as directed and to the satisfaction of Architect & Employer, at no extra cost.
- G.2.8. Any cutting and waste of timber, that may be incidental in carrying out an item, shall not be paid for extra, but shall be included in the rate for the item.

I.0. **WATER PROOFING TREATMENT:**

Water Proofing Treatment for Terraces

Providing and Laying of approved make water proofing treatment to Terrace with one layer of bituminous primer and one layer 3mm thick modified torch applied bituminous water proofing membrane with 160 GSM non woven polyester matt reinforcement including preparing the surface, seal the over lap joints with 100mm membrane properly Complete finished item of work at site as directed by Bank / Architect.

Water Proofing Treatment for toilets & bath rooms:

Specialized Acrylic Polymer based elastomeric cementitious water proofing treatment to the low lying bathroom/toilets.

Grouting to the sunken bathroom/toilets with grouting additives.

Drilling of the holes with pneumatic drilling machine (12 to 14mm sized holes), fixing of nipples and grouting with 140 PSI Grout Pump, mixing with Non-shrink Grout Additives 1 Kg per bag of cement removing of Nipples and filling with Acrylic putty.

Packing & Sealing of the out let pipes & Holes.

Packing and grouting pipe crossing in and of toilets sunken and beams. Preparing, uttering ,supplying, mixing, applying finishing, grouting and cutting the pockets holes left for pipe line crossing in the slabs and beams by using Acrylic bonding agent and cement slurry in ratio 1:1:3 (one of Acrylic bonding agent one of water and one of cement by volume) applied on the prepared clean surface and immediately mixing and applying Non-shrink/High Tolerance Grout using 3to 6mm hard bluw metals at ratio 1:1/2 by weight and restrained against upwards expansion etc.,

Providing the Chamfers at all Horizontal & vertical junctions.

Providing chamfers at the junction of slab and parapet with 100x100mm filler with cement, sand mortar, mixing with integral water proofing compound 200ml per bag of cement.

Specialized Acrylic polymer Elastomeric cementitious waterproofing treatment.

Preparation of surface from dust, loose materials, debris, mortar drooping, laitance, oil, grease or any other form of forge in matter. Providing Two coats of Elastomeric coating (Part-I and Part-II) 2.50

Kg/Sq.mtr. Upto 350mm Height.(Only Plan shall be measured for payment).

J. **PAINTING/POLISHING WORK:**

J.1 **LIME WASHING AND COLOUR WASHING:**

- J.1.1. The materials for preparing the lime wash shall be freshly burnt fat lime of good quality free from unburnt stone and other foreign matter.

This shall be dissolved in sufficient quantity of water (about 4-5 litres/Kg of lime), stirred thoroughly and strained through a clean coarse cloth. Alternately, ready made whiting, complying with I.S.63-1950, may also be used. Clean gum dissolved in hot water shall then be added in suitable proportion of 2 gm. of gum-arabic to a litre of lime, to prevent lime wash coming off easily when rubbed.

- J.1.2. Colour wash shall be lime wash prepared as above, to which a solution of water, lime and fast pigment, boiled if directed, shall be gradually added and stirred until the required shade/tinge is obtained.

- J.1.3. As required, single or double scaffolding or ladder shall be used, without damaging or scratching the wall/plastered surfaces/floors.

- J.1.4. The surfaces to be painted shall be prepared by removing all mortar droppings and foreign matter and thoroughly cleaned with wire or fibre brush. All holes or depressions shall be stopped with mortar and cured and surfaces made even and smooth before painting.

- J.1.5. Colour/lime wash shall be applied with a brush. The first stroke of brush shall be from top downwards, next from bottom upwards over the first stroke and further a stroke over the earlier brushing before it dries. This will form one coat. Each coat must be allowed to dry and shall be subject to inspection before the next coat is applied. When dry, the surface shall not show signs of cracking and shall present a smooth and uniform finish, free from brush marks, and it shall not come off easily, when rubbed with a finger. Patchy or streaky work will be rejected and shall have to be re-executed at the contractor's own expense. Unless otherwise specified, 3 coats of lime wash or colour wash shall be applied.

- J.1.6. Doors, windows, floors and other articles of furniture etc., shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed and surfaces cleaned.

J.2. **CEMENT WASH:**

J.3.1. **Dry Distempering:**

J.3.1.1. **Material:**

Powdered dry distemper shall be of approved make, colour and shade and manufactured by approved manufacturers. It shall generally confirm to IS:427 – 1965.

J.3.1.2. **Scaffolding:**

This shall be double or single as required and directed.

J.3.1.3. **Preparing the surface:**

The surface to be distempered shall be cleaned well and all cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared must be completely dry and free from dust before distemping is commenced. In the case of newly plastered walls, special care shall be taken to see that it is completely dry before any treatment is attempted. For old surfaces, which has earlier been distempered, the surface shall be cleaned well of grease, dust etc. The flaking of previous coating, if any, shall be removed/ taken off. All cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard and then sand papered and wiped clean. But in case the surfaces were colour or white washed, the wash must be removed thoroughly first.

J.3.1.4. **Priming Coat:**

The priming coat shall be applied over complete dry surface in the manner recommended by the manufacturer in cast of patent distemper. When no priming coat is specified by the manufacturer, finely powdered chalk mixed with a thin solution of glue shall be applied to prepare a good hard background. This coating, when dry, shall be sand papered as close and smooth as possible.

J.3.1.5. **Application of Distemper:**

The instructions of the manufacturer shall be followed, regarding the preparation of the surface and application of priming and finishing coats. Distemper shall not be mixed in quantities larger than is actually required for a day's work. Hot water may be used to prepare the mixture. Distempers shall be applied in dry weather with broad stiff brushes in long parallel strokes. The treated surface shall be allowed to dry and harden. Second or succeeding coats shall not be applied until the preceding coat has passed by the Employer & Architects. Two more

coats of distemper shall be given in exactly the same manner as the first one but only after the earlier coat laid has thoroughly dried. All the operations (strokes of brush) for one coat of white/colour wash will give two coats in case of distempering.

J.3.1.6. Rates to be inclusive of:

The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and distemper separately.
- ii) Scaffolding.
- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vi) Applying the distemper in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architects in 3 coats contractor shall carryout additional coats of distemper to approval, at contractor's own expense.

J.4. ACRYLIC WASHABLE DISTEMPER:

- J.4.1. Washable acrylic distemper shall be conforming to IS 2395 - 1 - 1966 and shall be of approved make and shade.
- J.4.2. As required, single or double scaffolding shall be used. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls/floors etc.
- J.4.3. The instructions of the manufacturer shall be followed regarding preparation of the manufacturer shall be followed regarding preparation of the surface and application of priming and finishing coats.
- J.4.4. Where the specifications of the manufacturer are not available, the following instructions shall be carried out:
- J.4.5. The surface shall be cleaned and all clears, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared shall

be completely dry and free from dust before distempering is commenced. In case of newly plastered surfaces/walls, special care shall be taken to see that it is completely dry before treatment is attempted.

The old surfaces which had earlier been distempered, shall be cleaned of grease and dust etc. All cracks, holes and surface defects shall be repaired with plaster of Paris and allowed to set hard and then sand papered smooth and wiped clean. The flakings of previous coatings, if any, shall be taken off. But in case the surfaces are colour or white washed, the wash must be removed thoroughly first.

J.4.6. The priming coat shall be applied over complete dry surfaces as recommended by the manufacturers or patent distemper.

J.4.7. Distemper shall be applied in dry weather with a broad stiff brush in long parallel strokes. This shall be allowed to dry thoroughly before the next coat is applied. All the operations (strokes of brush) for one coat of white colour wash will give two coats in case of distempering.

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and distemper separately.
- ii) Scaffolding.
- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vi) Applying the distemper in 3 coats minimum, including priming coat. If a proper even surface is not obtained to the satisfaction of the Employer and Architects in 3 coats contractor shall carry out additional coats of distemper to approval, at contractor's own expense.

J.5. **WATERPROOF CEMENT PAINT:**

The waterproof cement paint shall be of Super Snowcem or of any approved manufacture and it shall be of approved colour and shade. It shall be brought to site in original air tight containers with seals intact.

Double scaffolding and ladders shall be provided, if necessary, without damaging the wall surfaces to be painted.

The preparation of surface, mixing of paint and application shall be done as specified by the manufacturer. In the absence of manufacturer's specifications, the following shall be followed:

The surfaces shall be thoroughly cleaned free from dirt, dust, etc., by brushing and washing down with clean water. Any grease, oil paint or other foreign material shall be removed by approved method.

Colour/Lime wash and or distemper shall be thoroughly removed by washing, brushing and if necessary the accumulated coats of oil paint shall be removed by thoroughly brushing or scraping and washing and a clean even surface obtained.

Rough cast plaster and pebble dash surfaces shall be thoroughly brushed and washed to remove dust and dirt.

Dry cement paint shall be thoroughly mixed with clean fresh water to produce paint of required consistency. It shall be strained through a paint strainer. The paint shall be kept stirred thoroughly and applied within the specified time. Hardened or damaged paint shall not be used.

The paint shall be applied by brush. Each paint coat shall be properly cured and got inspected and approved by the Architects/Employer before the next coat is applied. Minimum 2 coats will be applied but if the work is not satisfactory, more coat/coats shall be applied as directed at no extra cost.

Absorbent surfaces shall be evenly damped so as to give even suction in dry weather, freshly painted surfaces shall be kept damp for atleast two days.

For smooth surfaces one coat of primer shall be applied as per manufacturer's specifications and three more coats of cement paint of approved shade shall be applied. All operations (strokes of brush) for one coat of white (colour wash will give two coats of cement painting).

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and waterproof cement paint distemper separately.
- ii) Scaffolding.

- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vi) Applying the waterproof cement paint in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architect in 3 coats, contractor shall carryout additional coats of work to approval, at contractor's own expense.
- vii) **Water repellent silicon liquid paint:**

Multipurpose protective coating.

PIDICOTEW – 100 is a protective coating system designed for vertical walls, and acts as a one-way membrane, allowing moisture to escape to the surface but prevents moisture ingress into the treated structure.

Application Areas:

- External wall surface for durable insulation effect.
- For wall surfaces, can be used as protective coating in the desired colour.
- For protecting industrial as well as residential structures from weathering effect.

Coverage:

- 10 to 12 Sq-m/lit of PIDEBIND P – 100 on smooth surface once the area is covered properly with primer coat then, apply one coat of PIDICOTEW – 100 with a coverage rate of 5 sqm/lit.
- After 1 hour of drying of first coat, second coat of PIDICOTEW – 100 shall be applied with the coverage rate of 5 sqm/lit.

J.6. **MODE OF MEASUREMENT (FOR J1 TO J5):**

For all the above painting items, Mode of measurement shall be same as that of plastering and shall be in Sq. Meters. No extra payment shall be made for painting rough cast surfaces or sand faced surfaces.

J.7. **ENAMELLED PAINTING:**

J.7.1. **Materials:**

- J.7.1.1. The paint shall be of the specified colour and shade and of an approved make by the Architect & Employer. The paint shall comply in all respects with relevant Indian Standard Codes.
- J.7.1.2. The make and brand of the paint to be used on the work shall first be got approved by the Architects/Employer. The material shall be obtained directly from the approved manufacturers or authorized dealers and brought to the site in the manufacturers drums etc., with seals unbroken.
- J.7.1.3. Paint for undercoating and finishing coat shall be ready mixed. Mixing by contractor is not permissible except with prior written approved of the Architects/Employer, in which case the preparations of ingredients and their quality shall be strictly maintained as per manufacturer's instructions and relevant I.S. codes.
- J.7.1.4. All the materials shall be kept properly protected when not actually in use. Lids of containers shall be kept closed and surfaces of paint in open shall be covered with a thin layer of turpentine to prevent formation of a skin.

In case of doubt regarding the quality, the paint supplied by the contractor shall be got tested in an approved laboratory as described in I.S. 101 – 1964, if considered necessary by the Architect. The cost shall be borne by the client, if the results are satisfactory, and by the contractor if otherwise. The rejected paint shall be removed from the site of work forthwith.

J.7.2. **PREPARATION OF SURFACE:**

J.7.2.1. **Plastered Surfaces:**

New plaster shall not be primed or painted till it is completely dry and hard. The surface shall be carefully rubbed smooth and thoroughly cleaned. The surface shall be dry, smooth, clean and free from dirt.

J.7.2.2. **Steel work (NEW):**

Degreasing shall be done by either proprietary brands of approved solvent cleaner or by mineral turpentine or petroleum and other petroleum solvents, like trichloroethylene alkali solutions or detergents as directed by the architects.

The de-rusting shall be done by manual scraping (by wire brushes, fine steel wool scraper, sand paper etc.) and/or mechanically by sand blasting, shot blasting or flame cleaning or chemical methods as approved by the Architects.

J.7.2.3. **Steel work (Old):**

For repainting necessitated due to any specified reason the relevant instructions given in I.S. 1447:1966 shall be followed. If necessary and ordered by the Architect, the surface shall be cleaned completely as for new steel.

J.7.2.4. **Wood Work:**

The surface to be painted shall be thoroughly dry, clean and smooth. It shall be sand papered with coarse medium grade sand papers and the finished surface shall be free from scratches.

J.7.2.5. Before applying primer, knots, if any, shall be covered with preparation of red lead made by grinding red lead in water and mixing with glue sized and used hot. The surface prepared for painting shall be dry before paint is applied. The holes and indentation on the surface shall be stopped with putty. Stopping shall not be done before the priming coat is applied.

J.7.3. **Application:**

J.7.3.1. All brushes, tools, etc., used shall be cleaned of all foreign matter at the beginning of different operations being undertaken.

J.7.3.2. Paint may be applied by spraying or brushing. Unless otherwise specified, paint shall be applied with brushes. Brushes of appropriate size shall be either round or oval shaped and they shall be maintained carefully throughout the work so as to be pliable and free from bristles.

J.7.3.3. The contents of the drum and tins shall be well stirred with a small clean and smooth stick before using and occasionally during use to prevent sedimentation at the bottom of the container.

J.7.3.4. Painting shall be carried out as far as possible in dry and warm weather.

- J.7.3.5. Single or double scaffolding shall be used as necessary, by the contractor at his cost. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls, floors etc.
- J.7.3.6. The primer coat shall be applied as soon as the surface has been cleaned and before deterioration of surface by rust and contamination of the surfaces by dust, dirt or any other foreign material.
- J.7.3.7. Sufficient time shall be allowed for each coat of paint to dry before the next is applied.
- J.7.3.8. Painted surface, shall be protected from sun, rain, condensation, contamination or surface damage, till it is completely dry. 'Wet paint' shall be put, when necessary.
- J.7.3.9. Preparation of surfaces, priming coat, undercoat and finishing coats shall be applied as specified or recommended by the manufacturer. Where no specifications are available, the following specifications will be followed.
- J.7.3.10. **Primer Coat: Plastered surface:**

Priming coat shall consist of equal parts of white and red lead mixed in boiled linseed oil to the required consistency applied uniformly over the surface. When this coat is dry, all cracks, holes and other such defects shall be filled with a mixture of one part of white lead and 3 parts of ordinary putty. After drying, the surface shall be rubbed with sand paper and dusted clean. An undercoat shall be applied thinly so that plaster may be thoroughly saturated. One or more undercoats with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

Steel Work:

The primer coat be of red lead conforming to I.S.102 - 1962. Undercoating and puttying shall be done, if necessary. For old painted surfaces and new surfaces already primer with red lead/red oxide, the surface shall be cleaned thoroughly and primed with red lead/ red oxide, at some places, where necessary or over the whole surface as directed by the Architects.

Wood Work:

The primer coat shall consist of red lead, white lead, raw and boiled linseed oil and patent driers.

After priming coat, all small holes, cracks, open joints and other minor defects shall be stopped with putty made from whitening mixed to proper consistency with raw linseed oil and little white lead to help hardening of putty. The surface shall then be lightly rubbed down smooth with sand paper. One or more undercoats, with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

J.7.3.11. **Finishing coats:**

Unless otherwise specified in the item, the finishing shall be done with atleast two coats of paint of approved make and shade confirming to the latest I.S. codes. The last coat of paint shall give a matt/flat, semi-glossy or glossy finish as specified for each item of painting or as directed by the Architect & Employer. Striple finish shall be given at no extra cost, if required, by the Architect & Employer. The finished surface shall be of the required shade and present an even appearance. It shall not show any brush marks. If required, final coat will be applied with rollers at no extra cost.

J.8. **ENAMEL PAINT:**

General specifications, preparation of surface and priming coat shall be same as specified for oil painting. Finishing shall be done in two coats or more as required with synthetic enamel paint of approved make and shade and shall generally conform to relevant I.S.codes.

J.9. **RATE FOR ALL PAINTING WORKS TO INCLUDE:**

Apart from other factors mentioned elsewhere in this contract, the rate for painting shall also include.

- J.9.1. Providing all the materials/labour and equipment that is required to execute the work as specified.
- J.9.2. Scaffolding (single/double) erection and removal.
- J.9.3. Preparing the surfaces before painting.
- J.9.4. Applying three coats of approved paint including priming coat. If proper & even surface or shade is not acquired, then extra cost/coats shall be applied as directed and to the final approval of the Architect & Employer, at no extra cost.
- J.9.5. Applying additional priming coat/coats to obtain thoroughly saturated surface and filling the putty as required and directed.

- J.9.6. No extra coat shall be paid for painting smooth/rough surfaces such as precast concrete pardsis, rough cast plaster, sand faced plaster etc.
- J.9.7. Curing the cement paint as directed for minimum 7 days.
- J.9.8. Doors, windows, floors and other materials of furniture etc., shall be protects from being splashed upon. Splashing and droppings, if any, shall be removed and the surfaces cleaned as directed.
- J.9.9. If any cracks develop in the plaster, before or after final painting, the same will have to be filled in by suitable putty and the surface painted again as directed to give an even surface to the approval of Architect & Employer at no extra cost. If neeru surface is damaged due to any reason before painting, then the surface shall be redone by using plaster of paris as directed, at no extra cost.
- J.10. **MODE OF MEASUREMENT FOR OIL, ENAMEL PAINT, POLISHING ETC:**
- J.10.1. Measurement of painted/polished surfaces shall be in Sq.m and as per plaster work.
- J.10.2. For measurement of polishing/painting to joinery and steel work etc., multiplying coefficients, as in standard table shall, be as follows:

S.NO.	DESCRIPTION OF WORK	HOW MEASURED	COEFFICIENT
I.	<u>Wood Work - doors and windows etc:</u>		
1.	Panelled doors/windows.	Measured flat including frame.	1.30 (for each side).
2.	Flush doors	- do -	1.20 (for each side).
3.	Partly panelled and partly glazed or glazed doors/windows (for glazed portions only - for panelled portions as per 1 above).	- do -	1.00 (for each side).

4.	Fully venetioned or louvered doors/windows.	- do -	1.80 (for each side).
S.NO.	DESCRIPTION OF WORK	HOW MEASURED	COEFFICIENT
II.	<u>Steel Work - Doors and Windows:</u>		
1.	Fully glazed doors & windows.	Measured flat including frame.	0.50 (for each side).
2.	Plain sheeted steel door,	- do -	1.10 (for each side)
3.	windows.	Measured flat.	1.50 (for painting all over)
4.	Collapsible gate.	-do- jamb guides bottom rails, locking arrangement included (top cover shall be measured separately)	1.10 for each side.
III.	<u>General work:</u>		
1.	Expanded metal, M.S. grill work, grating in guard bars, ballustrades, railing and partitions.	Measured flat.	1(for painting all over).
	R.C.C. grill.	- do -	1(for each side).

The table given above is as per C.P.W.D. specification.

J.11. **FRENCH SPIRIT POLISHING:**

J.11.1. **Materials:**

French spirit polish shall be of an approved make conforming to I.S.348:1968 and shall be approved by the Architects. If it is to be prepared, the polish shall be made by dissolving 0.7 Kgs of best shellac in 4.5 litres of spirit or wine without heating. To obtain required shade, approved pigment shall be added and mixed in required proportions.

J.11.2. **Workmanship:**

J.11.2.1. **Preparation of Surface:**

The surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Holes and indentations of the surface shall be filled with putty made of whiting and linseed oil. The surface shall be given a coat of filler made of 2.25 Kg of whiting and 1.5 litre of methylated spirit. When it dries, the surface shall again be rubbed down perfectly smooth with sand paper and wiped clean.

J.11.2.2. **Application:**

A piece of clean fine cotton cloth or cotton wool made into the shape of a pad shall be used to apply polish. The pad shall be moistened with polish and applied sparingly but uniformly and completely over the entire surface. It shall be allowed to dry and then only another coat is applied in the same way. To finish off, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly dampened with methylated spirit and rubbed lightly and quickly with a circular motion. The finished surface shall have a uniform texture and high gloss. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.12. **POLISHING:**

J.12.1. **Materials:**

This shall be of approved quality and make and brought to site in sealed containers as marketed by the manufacturers.

J.12.2. **Workmanship:**

J.12.2.1 **Preparation of Surface:**

Woodwork to be treated, shall be finished smooth. It shall then be stopped and rubbed down perfectly smooth with different grades of sand paper. (The final rubbing shall be done with sand paper which has

been slightly moistened with linseed oil and rubbed one over the other for a few seconds).

J.12.2.2. Application:

The mixture of the polishing shall be applied evenly, with a clean cloth pad in such a way that no blank patches are left, and rubbed continuously for half an hour. When the surface is quite dry, a second coat shall then be applied and rubbed for two hours or more if necessary, until the surface has assumed a uniform glass and is quite dry, showing no signs of stickiness when touched. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.13. MEASUREMENT:

Measurement for French/wax polishing and or polishing with ready made polish will be as per schedule stated herein before and the explanatory note on coefficient shall be as per C.P.W.D. specifications.

J.14. For all painting and polishing works (J.1. to J.12):

- (i) Detailed register shall be maintained, by the contractor, showing daily account of receipts, consumption and balance of different materials showing materials received and their consumption with location, and shall be checked by Employer & Architect as their discretion.
- (ii) Each coat of work shall be done in one building at a time and got approved before starting next coat in that building; and shall not be done room wise or floorwise.

Note: Any item not specified in this tender has to be executed as per latest standard

CPWD specification or as per manufacturers specification.

TECHNICAL SPECIFICATIONS

I. ROAD WORK:

1. MATERIAL:

a. Aggregate - Coarse:

Coarse aggregate as specified in the item shall be either crushed or broken stone, crushed slag, overburnt brick aggregate or one of the naturally occurring aggregates such as kanker or laterite of suitable quality as stated hereinafter and approved by the Engineer-in-charge.

In cases the contract is for supply of materials and consolidation and the contract amount of the item involving the use of coarse aggregate is more than Rs.one and half lakh and where the contract is for supply of materials only and the contract amount is more than one lakh the aggregate shall be got tested.

The stone aggregate shall conform to the physical requirements set-forth in Table given below. The type and size range of the aggregate shall be specified in the contract.

PHYSICAL REQUIREMENTS OF COARSE AGGREGATE

S.NO .	TYPE OF CONSTN.	TEST	TEST METHOD	REQUIREMENTS
1.	Sub-base	Los Angeles Abrasion value or Aggregate Impact value.	IS : 2386 (Part IV) IS : 2386 (Part IV) IS : 5640.****	60 percent max. *50 percent max.
2.	Base	(a) Los Angeles Abrasion value or Aggregate Impact value. (b) Flakiness Index.	IS : 2386 (Part IV) IS : 2386 (Part IV) IS : 5640 *** IS : 2386 (Part I)	50 percent max. *40 percent max. **15 percent max.
3.	Surface course	(a) Los Angeles	IS : 2386 (Part	40 percent max.

		Abrasion value or Aggregate Impact value. (b) Flakiness Index.	IV) IS : 2386 (Part IV) IS : 2386 (Part I)	30 percent max. **15 percent max.
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* Aggregates may satisfy requirements of either of the two tests.

** The requirements of flakiness index shall be enforced only in case of crushed broken stone and crushed slag.

*** Aggregates like brick metal, kankar and laterite which get softened in presence of water, shall be tested for impact value under wet conditions in accordance with IS:5640.

The coarse aggregates shall conform to one of the gradings given in Table given below. For crushable type of aggregates such as brick metal, kankar and laterite, grading shall not be regarded as very important.

GRADING NO.	SIZE RANGE	SIEVE DESIGNATION	% BY WEIGHT PASSING THE SIEVE
1.	90mm to 40mm	100mm	100
		80mm	65 - 85
		63mm	25 - 60
		40mm	0 - 15
		20mm	0 - 5
2.	63mm to 40mm	80mm	100
		63mm	90 - 100
		50mm	35 - 70
		40mm	0 - 15
		20mm	0 - 5
3.	50mm to 20mm	63mm	100
		50mm	95 - 100
		40mm	35 - 70
		20mm	0 - 10
		10mm	0 - 5

b. Crushed or Broken Stone:

When crushed or broken stone is specified as the coarse aggregate, it shall be hard, durable and free from excess of flat elongated soft and

disintegrated particles, dirt and other objectionable matter. However, the total quantity of such deleterious material including clay lumps, soft fragment, foreign material etc., shall not exceed 5% of the weight of the aggregate.

c. **Binding Material:**

Binding materials to prevent ravelling of water bound macadam construction shall consist of a fine grained material possessing plasticity index value of 4 to 9 when the water bound macadam is to be used as a wearing course, and to 4 to 6 when W.B.M. is being adopted as a sub-base/base course with bituminous surfacing on top of it. The plasticity index shall be determined in accordance with IS:2720 (Part V). The quantity of binding material used in each layer will be as per direction of Engineer-in-charge. Application of binding material may be dispensed with the approval of Engineer-in-charge, where screenings consists of crushable type material like moorum or gravel. Where earth cut for sub grade formation is used as binder with the approval of Engineer-in-charge, no separate payment shall be made for collection of this binder material.

d. **Bitumen Emulsion:**

A liquid product in which a substantial amount of bitumen is suspended in a finely divided condition in an aqueous medium and stabilized by means of one or more suitable materials. For all types of bitumen and tar, approved grades shall be specified in the description of the item.

e. **Bitumen Straight run:**

A range of grades, from a very soft to a very hard consistency, can be produced by varying the temperature and the rate of flow during distilling process. It shall be conform to IS:73-1961. Grades of bitumen for different uses is given in the below table:

BITUMEN GRADES

<u>Grade</u>		Temperature to which it shall be heated
I.	<u>For painting (Surface Dressing):</u>	
1.	Paving bitumen from Assam Petroleum A 90.	177° C to 190° C (Cold application)
2.	Paving bitumen from other sources S 90.	
3.	Bitumen emulsion min.50% bitumen content.	
II.	<u>For Premix Carpeting:</u>	
1.	Paving asphalt 30/40 or 80/100 heated and then mixed with solvent at atmospheric temperature at the rate of 70 grams per Kg of asphalt.	149° C to 177° C
2.	Bitumen emulsion min.60% bitumen contents (cold application).	

f. **Moorum:**

It shall be obtained from pits of weathered disintegrated rocks. It should preferably contain silicious material and natural mixture of clay of calcarious origin. The size of moorum shall not be more than 20mm.

g. **Stones for kerb and channels:**

Kerb and channel stones are provided on roads having raised berms for foot path etc. These shall be selected hard stone, sound, durable free from laminations and other structural defects. The length of each kerb and channel stone shall be not less than 49.5 cm except that 29.5 cm long stones shall be permitted for closures and for curves. The other dimensions shall be 30 x 20 cm for kerb stones and 30 x 10 cm for channel stones, unless specified otherwise. Kerb and channel stones shall be chisel dressed on exposed surface and edges. The dimensions of the exposed faces of kerb and channel stones shall be of sizes as specified with a tolerance of 10mm in width and depth. In the case of kerb stones a tolerance of 5 cm shall be allowed in the dimension of unexposed back and bottom faces and in the case of channel stones a tolerance of 10mm shall be allowed in thickness.

h. Stone Boundary:

The boundary stones shall be of either hard stone of sound and durable quality or precast R.C.C. These shall be in blocks of size 15 x 15 x 90 cm unless directed otherwise by the Engineer-in-charge. A tolerance of 12.5mm shall be permitted in the specified size. In the case of boundary stones of hard stone, the top 30 cm shall be chisel dressed on all the four sides and on the top.

The RCC boundary stones shall be cast in Cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size), reinforced with 6mm diameter mild steel bars or as directed and finished smooth with cement mortar 1:3 (1 cement : 3 fine sand). The specifications for RCC work shall apply.

2. SUPPLYING AND STACKING OF MATERIALS:

a. Aggregates/Red Bajri:

i. Stacking:

Ground where stacks are proposed to be made shall be cleared, levelled or dressed to a uniform slope and all lumps, depressions etc., shall be removed. The stacked metal shall be free from vegetation and other foreign matter. Coarse aggregate stack shall be made at places as directed by the Engineer-in-charge. All rejected stone metal shall be removed from site.

The aggregate shall be stacked in convenient units of one metre top width, 2.2m bottom width, 60 cm height and of length in multiples of 3m for new roads. Where berm width is limited or for repair works it shall be stacked in units of 40 cm top width, 1.4m bottom width, 50 cm height and length in multiples of 3m. Template of wood or steel shall be used for making the stacks and shall always be kept at site for check measurements. The Engineer-in-charge may permit stacking in different sizes and height ranging between 45 to 75 cm for new roads and 40 to 60 cm for repair work, in case the site conditions so demand.

The stacks shall be uniformly distributed along the road and shall be numbered serially. The number plate shall be planted on each stack, which shall remain in position until the stack is used in the work. A register showing daily consumption of stacks shall be maintained at site of work. The collection of stone metal shall be for completed length of one Km (for each layer of W.B.Macadam) or as directed by the Engineer-in-charge in writing.

ii) Measurements:

Length, Breadth and height shall be measured correct to a cm. The total quantity so arrived shall be reduced by 7.5% to arrive at the net quantity for payment, in case of aggregates. No such reduction shall be made in case of Red Bajri.

iii) Rate:

The rate shall include the cost of all materials and labour involved in all the operations described above.

b. Binder:

i) Stacking:

Specified binder shall be brought to the site of work in the sealed original containers. Binder brought in damaged containers shall not be allowed. The materials shall be stacked in fenced enclosure, as directed by the Engineer-in-charge, on one side of the roadway. The materials shall be purchased from reputed firms or their authorized dealer. All the drums brought to site shall be serially number and used in the same order. The materials shall be brought in at a time in adequate quantities to suffice for the whole work or for atleast a fortnights work.

For major bituminous road works, supply of bitumen in bulk may be taken for economical reasons, or if the contingencies of the work so require. Sufficient storage arrangement shall be made at site for atleast ten days requirement.

Materials shall be kept in the joint custody of the contractor and the representative of the Engineer-in-charge. The empty containers shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the Engineer-in-charge. A few drums may be removed before completion of work for heating bitumen and mixing aggregates etc., with the permission of the Engineer-in-charge.

ii) Measurements:

The materials shall be recorded as per standard weights of different type of container as intimated by manufacturers. The materials shall be weighed where the containers are found leaking.

iii) Rate:

The rate shall include the cost of all labour and materials involved in all the operations described above.

c. Moorum /Stone chippings:

The item of work shall specify moorum/stone chippings, as the case may be.

i) Stacking:

Ground where stacks are proposed to be made, shall be dressed to a uniform slope and all lumps, depression etc., shall be removed. Sample of moorum shall be got approved from the Engineer-in-charge, before the material in bulk is brought to site.

Moorum shall be stacked in convenient units of one cubic metre. The stacks shall be made with wooden boxes open at both ends and 2 x 2 x 0.25m dimensions. These shall always be kept at site for stacking and check measurement.

The stacks shall be uniformly distributed along the road. The supply of moorum shall be completed for the entire work or for a complete length of one Km or as directed by the Engineer-in-charge in writing.

ii) Measurements:

Length and breadth of boxes shall be measured correct to a cm. Volume shall be calculated in cubic metres, correct to two places of decimal.

iii) Rate:

The rate shall include the cost of all materials and labour involved in all the operations described above.

3. EARTH WORK:

a. Site Clearance:

- i) In case of Archaeological monuments protected within or adjacent to the area, the contractor shall provide necessary fencing around such

monuments as per direction of Engineer-in-charge and protect the same properly during execution. Payment for providing fencing shall be made separately.

- ii) Existing structures such as old buildings, culverts, pipeline, sewers etc., within or adjacent to the area if required to be removed, shall be dismantled as per direction of Engineer-in-charge which shall be paid for separately.
- iii) Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth upto 30 cm measured at a height of one metre above ground and rubbish removed upto a distance of 50 metres outside the periphery of the area under clearance. The roots of trees shall be removed to a minimum depth of 60 cm below ground level, or a minimum of 30 cm below formation level whichever is lower, and the hollows filled up with earth, levelled and rammed.
- iv) The trees of girth above 30 cm measured at height of one metre above ground, shall be cut only after permission of the Engineer-in-charge, is obtained in writing. The roots shall also be removed as described in the preceding sub-para. Payment for cutting and removing roots of such trees shall be made separately.
- v) **Setting out and making profiles:**

Masonry pillar shall be erected at suitable points in the area which is visible from the largest area to serve as bench mark, for the execution of the work. This bench mark shall be constructed and connected with standard B.M. as approved by the Engineer-in-charge. Necessary profiles with pegs, bamboos and strings or 'Burjis' shall be made to show the correct formation levels before the work is started. The contractor shall supply labour and materials for setting out and making profiles and 'Burjis' shall be maintained during the excavation.

The ground levels shall be taken at 5 to 15 metres intervals (as directed by the Engineer-in-charge) in uniformly sloping ground and at closer intervals where local mounds, pits or undulations are met with. The ground level shall be recorded in field books and plotted on plans. The plans shall be drawn to a scale of 5 metres to one cm or any other suitable scale decided by the Engineer-in-charge, North direction line and position of B.M. shall invariably be shown on the plans. These plans shall be signed by the contractor and the Engineer-in-charge, before the earth work is started. The labour

required for taking levels, shall be supplied by the contractor at his own cost.

b. Measurements:

- i. The length, breadth and depth shall be measured correct to a cm, in case the measurements are taken with tape. If the measurements are taken with staff and level, the level shall be recorded correct to 5mm and depth of cutting and heights of filling calculated correct to 5mm. The cubical contents shall be worked out to the nearest two places of decimal, in cubic metres.
- ii. Where excavation is in trenches or from borrow pits, in fairly uniform ground the measurements of cutting in trenches or borrow pits shall be made. In case of borrow pits, diagonal ridges, cross ridges or deadman, the position of which shall be fixed by the Engineer-in-charge, shall be left by the contractor to permit accurate measurements being taken on the completion of the work. Deduction of such ridges and deadman shall be made from the measurements unless the same are required to be removed later on and the earth so removed is utilized in the work. In the latter case nothing extra will be paid for their removal as subsequent operation.
- iii. Where the ground is fairly uniform or where the site is required to be levelled, levels shall be taken before the start and after the completion of the work and the quantity of excavation in cutting computed from these levels.
- iv. Where ordinary rock and hard rock is mixed, the measurements of the excavation shall be made as described in b(ii) & b(iii). The two kinds of rock shall be stacked separately and measured in stacks. The net quantity of the two kinds of rocks shall be arrived at by applying deduction of 50% for looseness in stacks. If the sum of net quantity of two kinds of rocks exceeds the total quantity of the excavated material, then the quantity for each type of rock shall be worked out from the total quantity in the ratio of net quantities in stack measurements of the two types of rocks. Where stacking is not feasible, the quantity of soft and hard rock shall be assessed either by means of cross-sectional measurements or by any other agreed method.
- v. Where soil, ordinary rock and hard rock are mixed, the measurements for the entire excavation shall be made as described in b(ii) & b(iii). Excavated material from 'hard rock' and 'ordinary rock' shall be stacked separately, measured, and each reduced by 50% to allow for voids to arrive at the quantity payable under the 'hard rock'

and 'ordinary rock'. The difference between the entire excavation and the sum of the quantity payable under 'hard rock' and 'ordinary rock' shall be paid for as excavation in 'ordinary rock' or 'hard soil' as the case may be.

- vi. Where it is not possible or convenient to take measurements from borrow pits or cutting, excavation shall be worked out from filling. The actual measurements of the fill shall be calculated by taking levels, of the original ground before start of the work after the site clearance and after compaction of the fill at suitable intervals and the quantity of earth works so computed shall be reduced by 10% in case of consolidated fills, by 5% in case the consolidation is done by heavy mechanical machinery to arrive at net cubical contents. No such deduction shall, however, be made in case of (i) consolidation done by heavy mechanical machinery at optimum moisture contents, (ii) consolidated fillings in confined situation such as under floors.

c. Rate:

Rate for earthwork shall include the following:

- i. Excavation and depositing earth, as specified.
- ii. Setting out works, profiles etc.
- iii. Site clearance
- iv. Forming (or leaving) 'Deadman' or 'Tell tales' in borrow pits and their removal after measurements.
- v. Bailing out or pumping of water in excavation from rains, sub-soil water etc.,
- vi. Protection and supporting of existing services i.e. pipes, water mains, cables met within the course of excavation. Care shall be taken not to disturb electric and communication cables, removal of which, if necessary, shall be arranged by the Engineer-in-charge.
- vii. Initial lead upto 50m and lift upto 1.5m.

4. EMBANKMENT CONSTRUCTION WITHOUT OPTIMUM MOISTURE CONDITIONS:

- a. Materials used in embankments shall be earth, moorum, gravel, a mixture of these or any other material approved by the Engineer-in-

charge. Such materials shall be free of logs, stumps, roots, rubbish or any other ingradient likely to deteriorate or affect the stability of the embankment. The work shall be so planned and executed that the best available materials are saved for the top portion of the embankment.

Highly expansive clays exhibiting marked swell and shrinkage properties may be deposited only at the bottom of the emabankment and no such material shall be placed nor permitted to remain in the top 500mm portion of the embankment below the sub-grade.

b. Preparation of Foundations:

The foundations of the embankment shall be ploughed to a depth of 15 to 25 cm. All clods shall be broken into fine earth and the area roughly levelled. The surface shall then be well watered before the earth work is started.

- c. Before commencement of filling the toe lines of the embankment shall be marked by pegs driven into the ground at 15 metres intervals and by continuous nicking (dag balings) to indicate the limits of the side slopes. Bamboo and string profiles shall be erected at every 60 metres interval in straight reaches and 15 metres apart in curved portions.
- d. Embankment materials shall be laid in 20 cm layers which shall be continuous and parallel to the finished grade. The placing of earth fill shall be done in the full width of embankment including slopes, and the section of formation shall be kept slightly sloping away from the centre to avoid pools of water forming due to rain. The height of filling in different sections shall be uniform as far as possible. All clods shall be broken while the earth is being placed. Organic matter of any kind shall be removed and disposed off as directed by the Engineer-in-charge.
- e. Jointing of old and new embankments shall be done by stepping in an over all slope of about 1 to 5.
- f. Each layer of earth shall be adequately watered to aid compaction.
- g. If the material delivered to the road bed is too wet it shall be dried by aeration and exposure to the sun, till the moisture content is acceptable for compaction. It shall then be rolled with roller of minimum ½ tonne weight, not less than 5 times, till it gets evenly and densely consolidated with wooden or steel rammers of 7 to 10 Kilograms weight having a base of 20 cm square or 20 cm diametre. The labour for ramming shall be atleast one rammer to six diggers.

Every third layer of earth and the top most layer shall be well consolidated with a payer roller of minimum 8 tonnes weight, rolled not less than 5 times, till the soil behaves as an elastic material and gets compressed only elastically under the load of roller.

- h. Before placing the next layer, the surface of the under layer shall be moistened and scarified with pick axes or spades, so as to provide a satisfactory bond with the next layer.

- j. **Dressing:**

The embankment shall be dressed neatly as per designed section and grade, after it has been completed and thoroughly consolidated. The top and slopes shall be protected from any damage and maintained, till the work is completed and handed over to the Engineer-in-charge.

- i. **Embankment around structures:**

To avoid interference with the construction of abutments, wing walls or return walls of culvert/bridge structure, the contractor shall at points to be determined by the Engineer-in-charge suspend work on embankments forming approaches to such structures, until such time as the construction of the latter of sufficiently advanced to permit the completion of approaches without the risk of interference of damage to the bridge works.

Unless directed otherwise, the filling around culverts, bridges and other structures upto a distance of twice the height of the embankment. The fill material shall not be placed against any abutment or wing wall unless permission has been given by the Engineer-in-charge but in any case not until the concrete or masonry has been in position for 14 days. The embankment shall be brought up simultaneously in equal layers on each side of the structure to avoid displacement and unequal pressure. The sequence of work in this regard shall be got approved from the Engineer-in-charge.

Where the provision of any fillet medium is specified behind the abutment, the same shall be laid in layers simultaneously with the laying of fill material. The materials used for filter material shall conform to the requirements for filter medium as specified. Payment for providing filter material shall be made separately under relevant items.

Where it may be impracticable to use power rollers or other heavy equipment, compaction shall be carried out by mechanical tempers or other methods approved by the Engineer-in-charge. Care shall be

taken to see that the compaction equipment does not hit or come too close to any structural member so as to cause any damage to it.

5. **EMBANKMENT CONSTRUCTION (UNDER OPTIMUM MOISTURE CONDITIONS):**

- a. In the case of earth work consolidated under optimum moisture conditions, each layer of earth shall be carefully moistened to give field moisture content of about +1% to -2% of the optimum moisture content (OMC). The OMC shall be determined according to IS:2720 - 1972 Methods of Tests for Soils (Annexure I Page _____). Each layer shall then be compacted by rolling width 8 to 10 tonnes power road roller and a sheep - foot roller if required. The required amount of water shall be added during consolidation to keep the moisture content of the soil at the optimum as per test. The density to be achieved shall not be less than 95% of the density obtained in the laboratory (Proctor method).
- b. Each compacted layer shall be tested in the field of density and accepted before the operations for next layer are begun.
- c. Control on compaction in the field shall be exercised through frequent moisture content and density determinations. A systematic record of these shall be maintained. At all times during construction the top of the embankment shall be maintained at such cross fall as will shed water and prevent ponding.
- d. **Density Measurement and Acceptance Criteria:**
 - i. One measurement of density shall be made for each 500 sqm of compacted area or for a smaller area as decided by the Engineer-in-charge. Each measurement shall consist of atleast 5 density determinations and the average of these 5 determinations shall be treated as the field density achieved. The determination of density shall be as per IS:2720 (Part XXVIII).
 - ii. In general the control at the top 40 cm thickness of the formation shall be more strict with density measurements being done at the rate of one measurement for 250 M² of compacted area. Further for the determination of the mean density the number of tests in one measurement shall not be less than 10 and the work will be accepted if the mean dry density equals or exceeds the specified density.
 - iii. When density measurements reveal any soft areas in the embankment, the Engineer-in-charge shall direct that these be compacted further. If inspite of that the specified compaction is not

achieved the material in the soft areas shall be removed and replaced by approved materials and compacted to the satisfaction of the Engineer-in-charge.

e. Control Tests on Borrow Material:

i. Soil suitable for consolidation under O.M.C. conditions should preferably have the following characteristics:

- Minimum percentage of clay. 10%
- Liquid Limit 14%
- Plasticity Index. 4%
- Percentage of silt should not exceed 50%
- Peat, Muck and organic soils are unsuitable.

ii. The Engineer-in-charge, may, however, relax these requirements taking into account availability of materials, Cost of transportation and other relevant factors.

6. SUBGRADE:

a. Preparation of Sub-grade:

The surface of the formation for a width of a sub base, which shall be 15 cm more on either side of base course, shall first be cut to a depth equal to the combine depth of sub-base and surface courses below the proposed finished level (due allowance being made for consolidation). It shall then be cleaned of all foreign substances. Any ruts or soft yielding patches that appear due to improper drainage conditions, traffic hauling or from any other cause, shall be corrected and the sub-grade dressed off parallel to the finished profile.

b. Consolidation:

The sub-grade shall be consolidated with a power road roller of 8 to 12 tonnes. The roller shall run over the sub-grade till the soil is evenly and densely consolidated and behaves as an elastic mass (the roller shall pass a minimum of 5 runs on the sub-grade). All undulations in the surface that develop due to rolling shall be made

good the material or quarry spoils as the cases may be and the sub-grade is rerolled.

c. **Surface regularity:**

The finished surface shall be uniform and conform to the lines, grades and typical cross-sections shown in the drawings. When tested with the template and straight edge, the variation shall be within the tolerances specified in the table given below:

Permissible tolerances of surface regularity

<u>Longitudinal Profile</u>	<u>Cross Profile</u>
Maximum permissible undulation when measured with a 3 metre straight edge.	Maximum permissible variation from specified profile when measured with a camber template.
24mm	15mm

Where the surface irregularity of the sub-grade falls outside the specified tolerances, the contractor shall be liable to rectify these with fresh material or quarry spoils as the case may be, and the subgrade rerolled to the satisfaction of Engineer-in-Charge.

d. **Measurements:**

The length and width shall be measured correct to a cm. The area shall be worked out in square metre, correct to two places of decimal.

e. **Rate:**

The rate shall include the cost of materials and labour required for all the operations mentioned above, unless specified otherwise.

7. **SOLING:**

The primary function of soiling is to distribute the load over a soft subgrade (ground surface) in such a way that there will be no sinking of the road crust into the Subgrade under the load of the traffic of the road.

Soling Stones:

The size of stone should not be more than 22.5 cm, not less than 10 cm in any direction, and height equal to the soling course with tolerance of 25mm.

a. Stacking of materials for road works at site:

The *soling stones* should be stacked in units of 1 to 1.25 metre height, and of uniform width and length, and all uniformly distributed along the road. Soling stones are measured in cu.metres. Actual dimensions of stacks should be recorded and the total quantity reduced by 15 per cent to arrive at the net quantity. Lengths, breadths and height should be measured correct to a cm.

Stacking of moorum, bajri, stone grit, etc., Ground where stacks are proposed to be made should be dressed to a uniform level and all humps, depressions etc., removed or filled up. Stacks are made in units of one cu.m, with wooden boxes open at both ends and 2 x 2 x 0.25m dimensions.

Stacking of stone aggregate. Ground where stacks are proposed to be made, should be dressed to a uniform level as for above. Stacks are made in units of one metre top width, 2.2m bottom width, 60 cm or for repair works, stacks may be in units of 40 cm top width, 1.4m bottom width, 50 cm height and length in multiples of 3m. Templates of wood or steel should be made for making the stacks. The stacks should be uniformly distributed along the road. Stone metal should not be dumped in heaps directly on the area where these are to be laid.

Stone metal is measured in cu.metres and correct to a cm to arrive at the contents. The total quantity so arrived is reduced by 7.5 per cent to arrive at the net quantity.

b. Preparation of subgrade for laying soling:

Soling is normally laid in a trench made in the subgrade (or ground surface). The width of the trench should be 30 cm (15 cm on either side) more than that of the proposed finished road surface, and depth below the proposed finished level equal to the combined depth of soling and metalling (due allowance being made for consolidation). Depth of soling is 15 cm consolidated in cutting and in good soil, and 22.5 cm consolidated in filling, made - up soil, or poor soil, which loose layers 17.5 cm and 26.0 cm respectively have to be laid with suitable templates. The trench dug for the soling should be made to have a profile of the same camber as the proposed finished road surface.

All soft places in the subgrade should be excavated and filled in with firmer spoil and well rammed before laying the bottoming or other foundation. The roller shall run over the subgrade till the soil is evenly and densely consolidated. All undulations in the surface that develop due to rolling should be made good with earth or quarry spoils and the surface rerolled. 8 to 12 tonnes power roller may be used and which shall pass minimum of five runs on the subgrade.

No soling or metal should be laid on a new road in filling (where additional earth has been put) unless it has been exposed to one rainy season, and the formation brought to proper level again and consolidated.

A road can also be opened to traffic after soling has been laid and pending metalling, any unevenness developed made good.

c. Soling Stones - Laying and packing:

Stones for soling should be of height equal to the thickness of the soling with base area of not less than 250 sq.cm, nor more than 500 sq.cm, and not to exceed in length and breadth twice its thickness. For sections in good soil, 13 to 15 cm boulder (when measured across the proudest part in any direction) are generally specified to be increased to 23 cm if the subgrade is of poor soil.

Soling stones should be hand packed as close as possible with their broadest side downwards and greatest length across the road, to the required camber of the top surface of the road by laying correct to the templates placed 15 metres apart. Joints should be staggered. Large size stones should be placed at the edges and centre of the road. Gauge pegs are driven at small distances to indicate the thickness of the stones to be laid. All interstices between stones should be wedged in with smaller stones, well driven in to make tight packing and complete filling of the interstices.

d. Consolidation of soling:

The soling should be thoroughly consolidated with power rollers of 8 to 10 tonnes weight, starting at the edges and working towards the centre. In case of super-elevated curves, rolling should commence from the inside (lower) edge and progress gradually towards the outside (upper) edge. Roller should be run over the same surface for at least eight times till the soling course is well consolidated. The surface should be checked by templates, any hollows formed filled in so as to conform with the gradient and camber of the final road surface level desired.

A layer of moorum or sandy soil, of thickness not less than 2.5cm, should be spread over the consolidated stone soling, watered and rolled with a light roller before the wearing course is laid, so as to form a cushion.

Boulders should not be laid directly on a clayey soil subgrade. The fine soil will enter the open graded water-bound macadam through the voids in the soling boulders due to change in moisture content in the clay soil or due to repetitive wheel loads and weaken the pavement. A layer of 8 to 10 cm of fine graded granular material laid over the foundation will prevent working up of the clay into the base course.

For one unit of stone (boulders) soling (taken as consolidated) 1.38 units of stone are collected.

Soling should not be laid in two layers as the top of the bottom layer has generally an uneven surface, and the upper layer is likely to rock under traffic. In cases where the full depth of soling specified cannot be obtained by a single rubble layer, a layer of large size metal of the necessary thickness should be laid over the rubble to fill the interstices in it and to give the necessary depth of soling.

8. **BASE COURSE:**

a. **Water Bound Macadam:**

i. **Quantities of Materials:**

Quantities of course aggregates and screenings required to be stacked for 75mm (approximate) compacted thickness of W.B.M. base course for 10 m² shall be as specified in the table given below:

<u>Coarse Aggregate</u>			<u>Stone Screenings</u>		
Classification	Size range	Loose Qty	<i>Gradings / classifications & size</i>	For WBM loose course	For WBM surface course
Grading 2	63 40mm	– 1.0m ³	Type A 12.5mm	0.20m ³	0.16m ³
Grading 2	63 40mm	– 1.0m ³	Type B 10.0mm	0.30m ³	0.25m ³
Grading 3	50 20mm	– 1.0m ³	Type B 10.0mm	0.30m ³	0.24m ³

The quantity of binding material required for 75mm (approximate) compacted thickness will be $0.09 \text{ m}^3/10 \text{ m}^2$ in the case of W.B.M. base course and $0.13 \text{ m}^3/10\text{m}^2$ when the W.B.M. is to function as a surface course.

ii. **Preparation of Foundation:**

In the case of an existing unsurfaced road, where new material is to be laid, the surface shall be scarified and reshaped to the required grade, camber and shape, as necessary. Weak places shall be strengthened, corrugations removed and depressions and pot holes made good with suitable materials before spreading the aggregate for the W.B.M. Where the existing road surface is black topped and the crust thickness is to be improved by a layer of W.B.M., 50mm x 50mm furrows shall be cut in the existing surface at one metre intervals at 45 degrees to the centre line of the carriage way before proceeding with the laying of course aggregate.

iii. **Spreading Aggregate:**

The coarse aggregate shall be spread uniformly and evenly upon the prepared base in required quantities with a twisting motion to avoid segregation. In no case shall these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly complete base be permitted. The aggregate shall be spread uniformly to proper profile by using templates placed across the road six metres apart. Where specified, approved mechanical devices may be used to spread the aggregates uniformly. The levels along the longitudinal direction upto which the metal shall be laid, shall be first obtained at site to the satisfaction of Engineer-in-charge, and these shall be adhered to.

The surface of the aggregate shall be carefully trued up and all high or low spots remedied by removing or adding aggregate as may be required.

The W.B.M sub-base shall be normally constructed in layers of 75mm compacted thickness. No segregation of large or fine particles shall be allowed and the coarse aggregate as spread shall be of uniform gradation with no pockets of fine material.

The coarse aggregate shall normally not be spread in lengths exceeding three days average work ahead of the rolling and blending of the proceeding section.

iv. **Rolling:**

Rolling shall be done with an 8-10 tonne roller. Rolling is continued till the required density (95% of Lab. Proctor Density) and a smooth surface obtained without leaving any roller marks on the surface.

v. **Setting and Drying:**

After final compaction of the course, the road shall be allowed to cure overnight. The next morning, defective spots shall be filled with screenings or binding material, lightly sprinkled with water, if necessary and rolled. No traffic shall be allowed till the macadam sets.

vi. **Surface Evenness:**

The surface evenness of completed W.B.M course in the longitudinal and transverse directions shall be within the tolerance specified in table given below:

Size of coarse aggregate	Longitudinal profile	Cross Profile
	Max. permissible undulation when measured with a 3m straight edge	Max. permissible undulation when measured with a camber template.
20-50mm or 40-63mm	12mm	8mm

The longitudinal profile shall be checked with a three metre long straight edge at the middle of each traffic lane along a line parallel to the centre line of the road. The transverse profile shall be checked with a series of three camber boards of intervals of 10 metres.

9. **SURFACE COURSES**

a. **Premix Carpet with Hot Bitumen:**

- i. This type of treatment is normally applied on roads where the motor traffic is medium intensity, but bullock cart traffic is fairly heavy. This treatment is suitable for district roads and for internal and service road in colonies. The consolidated thickness of this type of treatment shall be 2 cm or 2.5 cm as specified.

This treatment consists of applying a tack coat on the prepared base followed immediately by spreading aggregates pre-coated with specified binder to camber and consolidated.

Premix carpet shall not be laid during rainy weather or when the base course is damp or wet or when the atmospheric temperature in the shade is 16 °C or below.

ii. **Quantities of Materials:**

Quantities of materials shall be as given in Table below. A proper record shall be kept to ensure that the daily out turn of work is correlated with the quantity of bitumen used as per proforma given in Appendix A.

<i>Consolidated thickness of premix carpet</i>	Binder hot bitumen		Stone chippings	
	Tack Coat (Kg per Sqm)	Carpet	(Cum/10 Sqm)	
			12.5mm size	10mm size
2.00 Cm	1.00	(52 Kg/Cum of 12.5mm size and 56 Kg per cum of 10mm size stone chippings).	1.8	0.90
2.50 cm	1.00	- do -	2.25	1.12

iii. **Preparation of Premix:**

The aggregate shall be dry and suitably heated to temperature as directed by Engineer-in-charge before these are placed in the mixer to facilitate mixing with the binder.

Mixers of approved type shall be employed for mixing the aggregates with the bituminous binder.

The binder shall be heated to the temperature appropriate to the grade of bitumen approved by the Engineer-in-charge, in boilers of suitable design avoiding local overheating and ensuring a continuous supply.

The aggregates shall be dry and suitably heated to a temperature as directed by the Engineer-in-charge before these are placed in the

mixer. After about 15 seconds of dry mixing, the heated binder shall be distributed over the aggregates at the rate specified.

The mixing of binder with chippings shall be continued until the chippings are thoroughly coated with the binder. The mix shall be immediately transported from the mixer to the point of use in suitable vehicles or wheel barrows. The vehicles employed for transport shall be clean and be covered over in transit if so directed.

iv. **Spreading and Rolling:**

The premixed material shall be spread on the road surface with rakes to the required thickness and camber or distributed evenly with the help of a drag spreader without any undue loss of time. The camber shall be checked by mean of camber boards and inequalities evened out. As soon as sufficient length of bituminous material has been laid, rolling shall commence with 6 to 9 tonne power rollers, preferably of smooth wheel tandem type, or other approved plant. Rolling shall begin at the edges and progress towards the centre longitudinally. Except on the super elevated portions rolling shall progress from the lower to upper edge, parallel to the centre lines of the pavement. The consolidated thickness shall in no place be less than the specified thickness by more than 25%.

When the roller has passed over the whole area once, any high spots or depressions which become apparent shall be corrected by removing or adding premixed materials. Rolling shall then be continued until the entire surface has been rolled to compaction and all the roller marks eliminated. In each pass of the roller, preceding tack shall be overlapped uniformly by atleast $\frac{1}{3}$ width. The roller wheels shall be kept damp to prevent the premix from adhering to the wheels and being picked up. In no case shall fuel/lubricating oil be used for this purpose.

Rollers shall not stand on newly laid materials as it may get deformed thereby.

The edges along and transverse of the carpet, laid and compacted earlier shall be cut to their full depth so as to expose fresh surface which shall be painted with a thin surface coat of appropriate binder before the new mix is placed against it.

Further, the prepared finished surface shall be protected from traffic for 24 hours or such period as may be specified by the Engineer-in-charge.

v. **Surface Finishing:**

The surface regularity both in longitudinal and transverse directions shall be within the tolerances specified in table given below:

Longitudinal Profile	Cross Profile
Maximum permissible undulation when measured with a 3 metre straight edge.	Maximum permissible variation from specified profile when measured with a camber template.
10mm	6mm

The longitudinal profile shall be checked during rolling with a three metres long straight edge at the middle of each traffic lane along the road. Similarly, the transverse profile shall be checked with a set of three camber boards at intervals of 10 metres.

vi. **Rectification:**

Where the surface irregularity falls outside the specified tolerances the contractor shall be liable to rectify it to the satisfaction of Engineer-in-charge by adding fresh material and recompacting to specifications where the surface is low. Where the surface is high the full depth of the layer shall be removed and replaced with fresh materials and compacted to specifications.

vii. **Measurements:**

The length and width of the finished work shall be measured correct to a cm along the finished surface of the road. The area shall be calculated in square meter, correct to two places of decimal.

For record purposes, the measurement for binder and stone chippings shall be taken as 2b(ii), 2c(ii), before they are actually used on the work. Premeasurements of materials taken for record purposes shall simply serve as a guide and shall not form the basis for payment.

viii. **Rate:**

The rate shall include the cost of materials and labour involved in all the operations described above for the particular item.

10. **CUTTING W.B.M ROADS AND MAKING GOOD:**

a. **Cutting:**

All road crossings shall be cut in half the width at a time and repaired, unless otherwise permitted by the Engineer-in-charge. Cutting shall be straight and uniform in width. Soling stone and aggregate obtained from cutting macadam road shall be stacked separately, clear of the road surface. Aggregate shall be screened and stones of smaller size below 20mm and width rounded edges discarded and disposed off.

b. Making Good:

- i. After the trenches have been filled in with excavated earth I layers of 15cm thickness, watered, well consolidated with heavy iron rammers and brought to sub grade level, soling stone obtained from cutting shall be laid as per existing soling and consolidated with heavy iron rammers. Where the earth consolidation is well done, no settlement need occur subsequently, for this excess watering should be avoided.
- ii. New Aggregate 50mm nominal size, as required, shall be added to old aggregate and spread over to a depth of 7.5cm. This shall then be consolidated with hand roller or heavy iron rammers, as directed, first with light sprinkling then with sufficient application of water till the aggregate has become adequately consolidated and does not get displaced. All undulations shall be loosened by hand picking, surplus and the surface compacted again. When thoroughly consolidated, Kankar, moorum and red bajri, freshly collected shall be spread over it in 12mm layer and consolidated with hand roller or heavy iron rammers, with sufficient application of water till a uniform surface is obtained.
- iii. The finished surface shall be in camber with and left a little higher than the adjoining road surface to allow for any settlement on drying.

c. Measurement:

Length and width of cutting shall be measured correct to a cm. The area shall be calculated in square metre, correct to two places of decimal.

d. Rate:

The rate shall include the cost of materials and labour involved in all the operations described above.

401. GRANULAR SUB-BASE

401.1. Scope

This work shall consist of laying and compacting well-graded material on prepared sub-grade in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as sub-base lower sub-base and upper sub-base (termed as sub-base hereinafter) as necessary according to lines, grades and cross-sections shown on the drawing or as directed by the Engineer.

401.2. Materials

401.2.1. The Material to be used for the work shall be natural sand, moorum, gravel, crushed stone, or combination thereof depending upon the grading required. Materials like crushed slag, crushed concrete, brick metal and kankar may be allowed only with the specific approval of the Engineer. The material shall be free from organic or other deleterious constituents and conform to one of the three gradings given in Table 400-1.

While the gradings in Table 400-1 are in respect of close-graded granular sub-base materials, one each for maximum particle size of 75 mm, 53 mm and 26.5 mm, the corresponding gradings for the coarse-graded materials for each of the three maximum particle sizes are given at Table 400-2. The grading to be adopted for a project shall be as specified in the Contract.

401.2.2. Physical requirements: The Material shall have a 10 per cent fines value of 50 kN or more (for sample in soaked condition) when tested in compliance with BS: 812 (Part 111). The water absorption value of the coarse aggregate shall be determined as per IS: 2386 (Part 3); if this value is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS: 383. For Grading II and II materials, the CBR shall be determined at the density and moisture content likely to be developed in equilibrium conditions which shall be taken as being the density relating to a uniform air voids content of 5 per cent.

TABLE 400-1. GRADING FOR CLOSE-GRADED GRANULAR SUB-BASE MATERIALS

IS Sieve	Per cent by weight passing the IS sieve		
Designation	Grading I	Grading II	Grading III
75.0 mm	100	---	---
53.0 mm	80-100	100	---

26.5 mm	55-90	70-100	100
9.50 mm	35-65	50-80	65-95
4.75 mm	25-55	40-65	50-80
2.36 mm	20-40	30-50	40-65
0.425 mm	10-25	15-25	20-35
0.075 mm	3-10	3-10	3-10
CBR Value (Minimum)	30	25	20

**TABLE 400-2. GRADING FOR COARSE-GRADED GRANULAR
SUB-BASE MATERIALS**

IS Sieve	Per cent by weight passing the IS sieve		
Designation	Grading I	Grading II	Grading III
75.0 mm	100	---	---
53.0 mm		100	---
26.5 mm	55-75	50-80	100
9.50 mm			
4.75 mm	10-30	15-35	25-45
2.36 mm			
0.425 mm			
0.075 mm	<10	<10	<10
CBR Value(Minimum)	30	25	20

Note: The Material passing 425 micron (0.425 mm) sieve for all the three gradings when tested according to IS: 2720 (Part 5) shall have liquid limit and plasticity index not more than 25 and 6 per cent respectively.

401.3. Strength of Sub-Base

It shall be ensured prior to actual execution that the material to be used in the sub-base satisfies the requirements of CBR and other physical requirements when compacted and finished.

When directed by the Engineer, this shall be verified by performing CBR tests in the laboratory as required on specimens remoulded at field dry density and moisture content and any other tests for the "quality" of materials, as may be necessary.

401.4. Construction Operation

401.4.1. Preparation of Sub-grade: Immediately prior to the laying of sub-base, the sub-grade already finished to Clause 301 or 305 as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 80 – 100 kN smooth wheeled roller.

401.4.2. Spreading and Compacting: The sub-base material of grading specified in the Contract shall be spread on the prepared sub-grade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means as approved by the Engineer.

When the sub-base material consists of combination of materials mentioned in Clause 401.2.1, mixing shall be done mechanically by the mix-in-place method.

Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations, as in small-sized jobs. The equipment used for mix-in-place construction shall be rotavator or similar approved equipment capable of mixing the material to the desired degree. If so desired by the Engineer, trial runs with the equipment shall be carried out to establish its suitability for the work.

Moisture content of the loose material shall be checked in accordance with IS: 2720 (Part 2) and suitably adjusted by sprinkling additional water from a truck mounted or trailer mounted water tank and suitable for applying water uniformly and at controlled quantities to variable widths of surface or other means approved by the Engineer so that, at the time of compaction, it is from 1 per cent below the optimum moisture content corresponding to IS: 2720 (Part 8). While adding water, due allowance shall be made for evaporation losses. After water has been added, the material shall be processed by mechanical or other approved means like disc harrows, rotavators until the layer is uniformly wet.

Immediately thereafter, rolling shall start. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 80 to 100 kN weight may be used. For a compacted single layer up to 225 mm the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 kN static weight with plain drum or pad foot-drum or heavy pneumatic tyred roller of minimum 200 to 300 kN weight having a minimum tyre pressure of 0.7 MN/m² or equivalent capacity roller capable of achieving the required compaction. Rolling

shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional cross-fall and super-elevation and shall commence at the edges and progress towards the centre for portions having cross-fall on both sides.

Each pass of the roller shall uniformly overlap not less than one-third of the track made in the proceeding pass. During rolling, the grade and cross-fall shall be checked and any high spots or depressions, which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour.

Rolling shall be continued till the density achieved is at least 98 per cent of the maximum dry density for the material determined as per IS:2720 (Part 8). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re-compacted.

401.5. Surface Finish and Quality Control of Work

The surface finish of construction shall conform to the requirements of Clause 902.

Control on quality of materials and works shall be exercised by the Engineer in accordance with Section 900.

401.6. Arrangements for Traffic

During the period of construction, arrangement of traffic shall be maintained in accordance with Clause 112.

401.7. Measurements for Payment

Granular sub-base shall be measured as finished work in position in cubic metres.

The protection of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

401.8. Rate

The Contract unit rate for granular sub-base shall be payment in full for carrying out the required operation including full compensation for:

- (i) Making arrangements for traffic to Clause 112 except for initial treatment to verges, shoulders and construction of diversions;
- (ii) furnishing all materials to be incorporated in the work including all royalties, fees, rents where necessary and all leads and lifts;
- (iii) all labour, tools, equipment and incidentals to complete the work to the Specifications;
- (iv) carrying out the work in part widths of road where directed; and
- (v) carrying out the required tests for quality control.

SPECIFICATIONS FOR LAYING OF CONDUITS

1.1 RIGID NON METALLIC CONDUIT PIPES

Rigid non – metallic conduit pipes as per IS 9537 Part – 3 , 1976 are to be used for the wiring Installation and accessories for the pipes are to be in accordance to Indian Standards IS 3419 – 1976.

In case at DB Junction point if junction box is required junction box is to be provided and the same is to be fixed at free of cost.

Jointing of conduits should be done with suitable size of couplers and the same are to join with good quality adhesive.

Fixing of Conduit pipe should be done with Base Saddle and clamps at an interval of 60 cm.

All civil works and patch works indicated for providing electrical installations should be well finished to the satisfaction of the civil authorities. A certificate from them should be obtained to the effect that the civil and patch work done is to the satisfaction of civil authorities. It will be the responsibility of the electrical contractor to obtain such certificate from the civil engineer. Unless such certificate is produced this office will have right to withhold the bill.

List of Number of wires that are to be carried out in rigid non metallic conduit pipes is given below and the work is to be carried out in accordance with the same. The minimum thickness of the conduit pipe must be 1.6 mm and diameter should be 20 mm.

Size of table		SIZE OF CONDUITS, MM													
Normal cross Sectional area mm2	No, and diameter of wires mm			20		25		32		40		50		63	
		Number of Cables, Max													
				S	B	S	B	S	B	S	B	S	B	S	B
1.0	1/1.12*			7	5	13	10	20	14	-	-	-	-	-	-
1.5	1/1.40			7	5	12	10	20	14	-	-	-	-	-	-
2.5	1/1.80 3/1.06			0	5	10	8	18	12	-	-	-	-	-	-
4.0	1/ 2.24 7/0.38			4	3	7	8	12	10	-	-	-	-	-	-

6.0	1/ 2.80 7/1.06*			3	2	6	5	10	3	-	-	-	-	-	-
10.0	11/3.55+ 7/1.40*	-	-	-	5	4	3	7	-	-	-	-	-	-	-
		-	-	2	-	4	3	6	5	8	-	-	-	-	-
16.0	7/1.70	-	-	-	-	2	-	4	3	7	6	-	-	-	-
25.0	7/2.24	-	-	-	-	-	-	3	2	5	4	8	6	9	7
38.0	7/2.50	-	-	-	-	-	-	2	-	4	3	7	5	8	6
50.0	7/3.00+ 19/1.80	-	-	-	-	-	-	-	-	2	-	5	4	6	5

“*” for copper conductors only.

“+” for aluminum conductors only.

Inspection type conduits fittings such as inspection boxes, draw boxes, bends, elbows and tees shall be so installed that they remain accessible for such purposes as withdrawal of existing cables or installation of additional cables.

**LIST OF MATERIALS OF APPROVED BRAND OR MANUFACTURER AND
SPECIALISED AGENCIES**

(CIVIL) APPENDIX 'A'

The contractor shall so quote for items to cover cost of the materials, as specified below. The contractor shall obtain prior approval from Architect/Client before placing order for the specific materials/agencies. In case of non-availability of any of the approved/ specified materials/ Agency, during the execution of the work, the Architects and Employer may approve suitable equivalent brand/ Agency and his decision shall be final and binding on the contractor and the price variations, if any, shall be adjusted accordingly.

- | | | | |
|------|---|---|--|
| 1a). | White/coloured glazed tiles | : | 1 st quality of Jhonson& Johnson, Somany, Khajaria or equivalent. |
| b) | Vitrified tiles | : | URO,RAK ceramics ,Kajaria, Johnson, or equivalent. |
| 2. | Flush doors | : | Anand, Raveela,Mayur, Kit Ply, Century or equivalent with ISI mark. |
| 3. | Teak particle boards | : | Anchor, DECO, Bhutan |
| 4. | Sections of Aluminium doors, by partitions etc. | : | Standard sections Jindal specified the Employer/ Architect. |
| 5. | Water proofing compounds | : | ArdexEndura, FOSROC, Pidilite or equivalent. |
| 6. | Hardeners | : | Hardcrete manufactured, by Snowcem (India), or equivalent. |
| 7. | Paint & Distempers | : | Asian, Nerolac or equivalent. |
| 8. | Water proof cement | : | Super Snowcem or equivalent. |
| 9. | Water repellant Silicon paint | : | Pidilite or equivalent. |
| 10. | Glazing | : | Modiguard, ASAHI, Saint Gobain |
| 11. | Hardware Dorset,dorma or equivalent. | : | Hettich,Hafele, |

12.	Door closers, floor springs	:	Everite, Dorset or equivalent.
13.	Water seal (Epoxy Stearate) Compound	:	Ardex Endura, Fosroc or equivalent.
14.	Rolling shutters, rolling grills	:	As per IS specifications
15.	Ready Mix Concrete Birla/NUVOCO	:	Lafarge / Ultra Tech /
16.	ACP	:	Alstrong, Durabond, Aludecor
17.	Interlock pavers pavers	:	Hindustan, Ultra, Classic, Earth
18.	Designer concrete tiles pavers	:	Hindustan, Ultra, Classic, Earth
19.	Putty	:	Birla wall care putty, JK, Asian
20.	Fire rated doors	:	Shakti Hermann or equivalent
21.	Shera Boards	:	SCG, Conwood
22.	UPVC Windows	:	NCL, Fenesta,,Aparna etc
23.	Electrical PVC Conduits	:	Sudhakar, Finolex, Avon etc
24.	Cement	:	ACC/ultratech/bharthi/Raasi/kcp/ RAJASHRI
25.	Reinforcement steel	:	TATA/VSP/SAIL/JSW
26.	Bitumen	:	Indian oil /hp/

GENERAL NOTE:

Any item/specification where in it is stated as equivalent means it should be equal in respect of quality and cost. While opting any "Equivalent" make, prior written approval of Architects and Bank shall be obtained.

LIST OF MANDATORY TESTS

MATERIALS	TEST	TEST PROCEDURE	MIN.QTY.	FREQUENCY
Chemical and physical properties of lime.		I.S.6932 (Part I) : 1973	5 M.T.	10 mt. Or par thereof.
SAND	a. Stilt Content	Field	20 Cum	20 cum or par thereof.
	b. Bulking	Field	20 Cum	50 Cum or par thereof
	c. Particle size distribution.	Field	40 Cum	Every 40 Cum or part, required in RCC work.
COARSE AGGREGATE	a. Particle size distribution b. Crushing value	Field	45 Cum	Every 45 cum or par thereof for RCC work. For rest of work as desired. b. Every 300 Cum
R.C.C.	1. Slump	Field		Once a day as desired.
	2. Cube strength		20 cum in slabs, beams and connected columns	Every 20 cum of a days concrete.
BRICKS	1. Water absorption and Efflorescence		Designation 35	One test for each source of manufacture.
	2. Compressive Strength.		Designation 35	1,00,000 or par thereof. For larger quantities

				two tests for 1 lot of 1 lakh. One test for every additional 2 lakhs or part thereof.
TIMBER	Moisture Content		1 Cum	Every three cum or part.
MORTICE LOCKS	Testing of springs		50 Nos.	100 or part thereof.
STEEL	a. Tensile strength	IS - 1529	20 Tonne	Every 20 tonne or part.
	b. Bending strength	IS - 1529	20 Tonne	Every 20 tonne or part.

MATERIALS	TEST	TEST PROCEDURE	MIN.QTY.	FREQUENCY
WHITE GLAZED TILES	1. Water absorption	I.S.777	10000 Nos.	10000 or part
	2. Crazing	- do -	- do -	- do -
	3. Impact	- do -	- do -	- do -
FLUSH DOORS	1. End immersion	I.S.2202		
	2. Knife	I.S.4020	No.of shutters used	No.of shutters to be tested.
	3. Adhesion		22 - 65 66 - 100 101 - 180 181 - 300 301 - 500 501 - above	1 2 2 3 4 5
AL.DOORS AND	Thickness of anodic coating	IS - 5523		If the cost of the fittings

WINDOWS TESTING				exceeds Rs.20,000/-
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Note: Minimum quantity give above is the quantity of work which warrants conduction of respective tests.

1. Cost of samples, testing and transport will be borne by the contractors only.
2. Any other materials shall also be got tested by contractors at his own cost as per the instructions of Architects/Employer from time to time.
3. Frequency stated above is minimum and the contractor may have to test materials with any other frequency, as instructed by Architect/Client, without any costs.

Tests on bitumen

There are a number of tests to assess the properties of bituminous materials. The following tests are usually conducted to evaluate different properties of bituminous materials.

1. Penetration test
2. Ductility test
3. Softening point test
4. Specific gravity test
5. Viscosity test
6. Flash and Fire point test
7. Float test
8. Water content test
9. Loss on heating test

SAFETY CODE

Suitable scaffolds should be provided for workman for all the works that cannot safely be done from the ground or from solid construction, except in cases of short duration works, which 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, it shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450mm and a maximum rise of 300mm. Suitable foot and hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal to 4 vertical).

Scaffolding or staging more than 300mm above the ground or floor, swung or suspended from an overhead support, shall be erected with stationery supports and shall have guard rails properly attached, bolted, braced and otherwise secured and atleast 900mm high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such openings as may necessary for the access of persons and delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

Working platform, 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 3-6m above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened, as described in (ii) above.

Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing, whose minimum height shall be 900mm.

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 9 M in length while the width between side rails in ring ladder shall be in no case be less than 300mm. For longer ladders, this width should be increased atleast 6mm for each additional foot of length. Spacing of steps shall be uniform and shall not exceed 300mm.

Adequate precautions shall be taken to prevent danger from electrical equipment. At the work site, no materials shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall also 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 damages and costs, which may be awarded in such

suit, action or proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.

I. **Excavation and Trenching:**

All trenches, 1.2m or more in depth, shall at all times be supplied with atleast one ladder for each 30m in length or fraction thereof. Ladder shall be extended from bottom of the trench to atleast 900mm above the surface of the ground. The side of the trenches which are 1.5m or more in depth shall be stepped back to give suitable slope or securely held by timber shoring, so as to avoid any danger to sides collapse. The excavated material shall not be placed within 1.5m of the edge 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 under cutting shall be done.

II. **Demolition:**

Before any demolition work is commenced and also during the progress of the work.

- a. All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
- c. All practical steps shall be taken to prevent danger to persons employed, from the risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so over- loaded with debris or materials, so as to render it unsafe.

III. All necessary personal safety equipments as considered adequate by the Architects should be kept available for the use of the persons 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 the concerned.

- a. Workers employed in mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.

- b. Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
- c. Those engaged in welding works shall be provided with welder's protective (eye) shields.
 - a. Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- e. When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated atleast for an hour before the workers are allowed to get into the manhole and the manholes so opened shall be cardoned off with suitable railing and provided with warning signals or boards to prevent accidents to the public.
- f. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
 - i) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.
 - ii) Suitable face masks should be supplied for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scrapped.
 - iii) Overalls shall be supplied by the contractors to the workers and adequate facilities for washing shall be provided to the working painters during and on cessation of work.
- IX. When the work is done near any place, where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
- X. Use of hoisting machine and shackle including their attachments, in charge and supports shall conform to the following standards or conditions.
 - 1.a. These shall be of good mechanical construction, sound material and adequate strength and free from any patent defects and shall be kept 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.
- 2. 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 or give signals to the operator.
- 4. In case of every hoisting machine and of every chain, ring hook, shackle swivel and pulley block used in hoisting or lowering 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 above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
- 5. In case of departmental machines, the safe working load shall be notified by the clients. As regards contractor's machines the contractor shall notify the safe working load of the machines to the consultants, whenever he brings any machinery to site of work and get it verified by the consultants.
- XI. 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 and minimise the risk of accidental descent of loads. Adequate precautions should be taken to reduce to the minimum risks of any part of a suspended load becoming accidentally displaced. Sleeves and boots as may be necessary should be provided, whenever workers are employed on electrical installations. The workers should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.
- XII. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition. No scaffold, ladder, or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place of work.
- XIII. 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 clients or the Architect.

- XIV. These safety provisions should be brought to the notice of all concerned by display of a notice board at a prominent place of the workspot. The person, responsible for compliance of the safety code, shall be named therein by the contractor.
- XV. Notwithstanding the above clauses for (i) to (xiv), there is nothing in these to exempt the contractor from the operation of any other Act or Rules in force in the Republic of India.

LABOUR LAWS AND RULES

The Site Engineer shall ensure that the contractor maintains relevant records and fulfils all conditions and requirements in accordance with

- a. The payment of Wages Act
- b. Employer's Liability Act
- c. Workmen's Compensation Act
- d. Contract Labour (Regulations & Abolition) Act 1970 and Central Rules 1971.
- e. Apprentices Act 1961.
- f. Any other Act or enactment relating thereto and rules framed thereunder from time to time.

The Site Engineer shall refrain from involving himself and the supervisors under him by comments/advice/attempts at mediation in any kind of labour dispute at site. His job is only to report to his superiors any happenings of the this sort in an objective manner.

EMPLOYER'S RESPONSIBILITY - CONTRACT LABOUR (REGULATIONS AND ABOLITION) ACT 1970 AND RULES 1971

With a view to ensuring that the provisions of the Act are not contravened, the Site Engineer should give particular attention to the following points and see that all the provisions of the Act are enforced:

1. Principal Employer (Banks) is registered as per the Act.
2. Contractor holds a licence under the Act from the Local Labour Commissioner for the appointment of Contract labour.

3. Required notice boards, registers and records as provided in section 29 of the Act are maintained by the contractor.
4. Payment of proper wages as per the rules are effected within the prescribed time limits by the contractor.
5. Prescribed facilities and amenities are provided by the contractor.
6. Proper efforts are made by the contractor to set right contravention of law, as soon as the notice pointing out the same is received from the Labour Enforcement Officer, and reports "on action taken" are sent to the Labour Enforcement officer at the earliest with copies to the Employer.

DECLARATION

The Assistant General Manager (P&E),
Premises & Estate Dept. LHO-Hyderabad,
Ground Floor , SBI LHO Campus,
Bank Street, Koti,
Hyderabad – 500 095, Telangana

NAME OF THE WORK: PROPOSED CIVIL WORKS REPAIR & RECARPETING OF EXISTING BITUMEN ROAD AT LHO CAMPUS, BANK STREET KOTI HYDERABAD

I/We _____ have inspected the site of works and have made me / us fully acquainted with the local conditions in and around the sites of works. I/We hereby declare that I/We have gone through the conditions laid down in the Notice Inviting Tender, Conditions of Contract, Technical Specifications, Bill of Quantities, approved makes and understood the same and on the basis of the same I/We quoted our rates in the Schedule of Quantities attached with the tender documents.

We accept all the terms and conditions of tender documents. We will abide by the technical specification mentioned in the tender. We here by undertake to use only specified material/ make as per the tender schedule.

I undertake to submit a hard copy & scanned copy of the tender duly signed on all pages of the tender at your office.

For any type of deviation (to any of above or subsequent instructions), it will be my/ our responsibility to obtain the written instruction of the Engineer-in-charge for the same failing which it shall be deemed that I have carried out any such deviations at my own and I shall be duty bound to replace the all deviated material/ works from the site at my/ our cost as well as I shall be liable to penalized by the employer as deemed fit and for all such loses made thereof, I/ we shall not have any right to arbitrate in any manner.

I/We shall also uniformly maintain such progress as may be directed by the Employer / Architect to ensure completion of same within the target date as mentioned in the tender document.

Witness:_____

Signature of Tender

Address_____

Date: _____

**BOQ FOR PROPOSED RECARPETING WORKS TO
BITUMEN ROAD AT STATE BANK OF INDIA, LOCAL HYDERABAD OFFICE,
HYDERABAD, TELANGANA**

Sl.No.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BITUMEN ROAD				
1	Providing and applying Tack coat 0.25kg Per Sqm using hot straight run bitumen of grade 80/100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications, complete etc as per the directions of Bank.	SQM	3,225		
2	Cleaning the existing surface with blower and filling pot holes providing and laying 30 mm premix carpet after compacing surfacing with stone chippings (60% with 12.5mm nominal size and 40 % with 10mm nominal size) @ 2.6 cum per 100 sqm and course sand @ 2.6 cum per 100 sqm of road surface and with bitumen complying with IS : 8887-1995 @ 56 kg /cum of stone chippings and 128 kg/cum of sand over a tack coat with hot straight run bitumen, including consolidation with road roller of 8 to 10 tonne etc. 5%Bitumen content complete as per the direction of the Bank (Proper drainage slopes to be provided for easy runoff water)	SQM	3,225		

3	Providing and laying Dense Graded Bituminous concrete using Aggregates of specified grading, premixed with bituminous binder and filler ,transporting the hot mix to work site by tippers laying with mechanical paver and rolled with Vibro Roller, Complete as per specifications with Desired compacted thickness 4.5% Bitumen content by weight of total mix.VG30 Bitumen Grade, with a compacted thickness of 50mm.	CUM	6		
4	Removing and refixing the existing road speed breakers	No's	3		
	Total			Rs.	
	% Discount If Any			Rs.	
	Grand Total (Excluding GST)			Rs.	