TENDER DOCUMENT

FOR

CONSTRUCTION OF 2-DOCTOR'S DISPENSARY AT VILAKUDY, KOLLAM, FOR ESIC

PART-III
PRICE BID

TENDER NO. HLL / ID / 13 / 41

MAY- 2013

HLL LIFECARE LIMITED.
INFRASTRUCTURE DEVELOPMENT DIVISION

INDEX

SPECIFICATIONS

GENERAL

The quoted rates for various items in the tender shall be inclusive of all the additional conditions and particular specifications and for adherence to all these conditions and specifications, no extra payment shall be made to the contractor. Any infringement and/or breach of these specification and condition(s) etc. shall render the contractor liable to action(s) under various clauses of the contract and such action stipulated in conditions therein.

"A" SPECIFICATIONS

1. The Contractor shall maintain safe custody of materials brought to the site. The Contractor shall also employ necessary watch and ward establishment for the work and other purposes as required at his own cost.

2. For Cement and Steel and other materials, as prescribed, the quantities brought at site shall be entered in the respective material at site accounts and shall be treated as issued for maintenance of daily consumption.

3. The procurement of Cement and Reinforcement Steel, and, their issue and consumption shall be governed as per conditions laid down hereunder.

3.1. Cement

3.1.1. The contractor shall procure 43 grade cement Conforming to IS: 8112 / IS: 1489, as required in the work, from reputed manufactures of cement such as A.C.C. Ultra Tech, India Cements, Malabar Cement, Ramco Cement, Cement Corporation of India or equivalent holding license to use ISI certification mark for their product whose name shall be got approved from Engineer-in-Charge. Supply of cement shall be taken in 50 kg bags bearing manufacture's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested whenever felt necessary in accordance with provisions of the relevant BIS codes. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so.

3.1.2. The Cement shall be brought at site in bulk supply of approximately 20 tonnes or as decided by the Engineer-in-Charge.

3.1.3. The cement godown of the capacity to store about 500 bags of cement or as decided by the Engineer-in-Charge shall be constructed by the contractor at site of work for which no extra payment shall be made. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-Charge or his authorized representative and the key of other lock

shall remain with the contractor. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge or his authorized subordinate at any time.

3.1.4. The contractor shall supply free of charge the cement required for testing. The cost of tests shall be borne by the contractor/ Department in the manner indicated below:

i. By the contractor, if the results show that the cement does not conform to relevant BIS codes.

ii. By the Department, if the results show that the cement conforms to relevant BIS codes.

3.2. Steel

3.2.1. The contractor shall procure steel reinforcement bars conforming to relevant BIS codes from main producers like SAIL, TISCO, VSP, IISCO etc. as approved by the Ministry of Steel. In cases when the contractor is required to procure steel reinforcement bars conforming to relevant BIS codes from other than main producers such as secondary producers or re-rollers having BIS License, can be done with prior approval of the Engineer-in-Charge. The procurement of TMT Bars conforming to relevant BIS codes shall be made from main producers and secondary producers having BIS License with prior approval of the Engineer-in-Charge. The contractor shall have to obtain and furnish test certificates to the Engineer-in-Charge. The contractor shall have to obtain and furnish test certificates to the Engineer-in-Charge in respect of all supplies of steel brought by him to the site of work. Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in the relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to BIS codes, the same shall stand rejected and shall be removed from the site of work within; a weeks' time of written order from the Engineer-in-Charge to do so.

3.2.2. The steel reinforcement shall be brought to the site in quantity of lots as approved by the Engineer-In-Charge.

3.2.3. The steel reinforcements shall be stored by the contractor at site of work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes (diameters) and lengths shall be stored separately to facilitate easy counting and checking.

3.2.4. For steel procured from main producers, for checking nominal mass, tensile strength, bend test, etc. specimen of sufficient length shall be cut from each diameter of the bar at random at frequency not less than that specified below. In case of works costing more that 2 Crores and when the steel is procured from other than main producers, additional tests such as, retest, re-bend test, elongation test, proof stress may also be conducted

Size (Diameter) of bar	For consignment	
	Below 100 tonnes	Over 100 tonnes
Under 10mm dia	One sample for each 25 tonnes or part thereof	One sample for each 40 Tonnes or part thereof
10mm to 16mm dia	One sample for each 35 tonnes or part thereof	One sample for each 45 Tonnes or part thereof.
Over 16mm dia	One sample for each 45 tonnes or part thereof.	One sample for each 50 Tonnes or part thereof.

3.2.5. The contractor shall supply free of charge the steel bars required for testing. The cost of tests shall be borne by the contractor/ Department in the manner indicated below:

1. By the contractor, if the results show that the steel does not conform to relevant BIS codes.

2. By the Department, if the results show that the steel conforms to relevant BIS codes.

3.2.6. Coefficient of weight i.e. the weight per unit length of the steel procured by the contractor shall be ascertained at site before using it and certified by the Engineer-In-Charge. In case weight per unit length is beyond the rolling margin as laid down in the BIS: 1786, the steel will be rejected and shall be removed from the site of work within; a weeks' time from the date of written order from the Engineer-in-Charge to do so. In case weight per unit length is more than the standard coefficient of weight for the diameter, but is within the rolling margin, then the payment shall be made as per the standard weight per unit length, and, where the weight per unit length is lesser than the standard coefficient of weight for the diameter, but is within the rolling margin, the payment shall be restricted with respect to the actual weight per unit length of the diameter.

3.3. The standard sectional weights referred to in standard table under para 5.3.3., page 75 of the revised CPWD Specifications 2002 for Cement Mortar, Cement Concrete and RCC works, are to be considered for conversion of length of various sizes of Steel Reinforcement bars into weight and are reproduced below for ready reference.

SIZE (mm)	WEIGHT (Kg/M)	SIZE (mm)	WEIGHT (Kg/M)
6	0.222	20	2.467
8	0.395	22	2.985
10	0.617	25	3.856
12	0.888	28	4.836
16	1.579	32	6.316
18	1.999	36	7.986

3.4. Steel and Cement brought to site and remaining unused shall not be removed from site without the written permission of the Engineer-In-Charge.

3.5. Cement used in Ready Mix Concrete shall be evaluated based on the certification by the in-charge of the RMC Plant in accordance with design approved by the Engineer-In-Charge.

4. Some restrictions may be imposed by the security staff etc. on the working and/ or movement of labour, materials etc. and the contractor shall be bound to follow all such restrictions/ instructions and nothing extra shall be payable on this account.

5. The contractor shall comply with proper and legal orders and directions of the local or public authority or municipality and abide by their rules and regulations and pay all fees and charges which he may be liable and nothing extra shall be payable on this account. The work shall be carried out without infringing on any of the local Municipal Bye-Laws.

6. The contractors shall given a performance test of the entire installations as per standard specifications before the work is finally accepted and nothing extra what so ever shall be payable to the contractor for the tests.

7. The contractor shall engage licensed plumber for sanitary, water supply, drainage work and also get all the materials and system (including the materials supplied if any, by the department) tested by the Municipal Authority, Whenever required, at his own cost including testing fees, transport etc. according to Municipal by Laws. The contractor shall produce necessary certificate from the Municipal Authorities after completion of work. Nothing extra will be paid on this account. The Contractor shall execute the guarantee for removal of defects after completion in respect of water supply and sanitary installation.

8. The water supply sanitary installation and drainage work shall be carried out in a manner complying in all respects with the requirement of relevant by laws of the local municipal authority of the place at no extra cost of the department.

9. The rate for every item of work to be done under this contract shall be for all heights, depths, lengths and widths of the structure (except where specially mentioned in the item) and nothing extra will be paid on this account.

10. The contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards such as day and night boards, speed limit boards and flags, red lights and providing barriers etc. He shall be responsible for all damages and accidents caused due to negligence on his part. No hindrance shall be caused to traffic during the execution of work. Nothing extra shall be paid on this account.

11. The contractor will work in close liaison, during the works, with other contractors of water supply, sanitary, drainage arrangements, electrical installation and any other works and adjust his work plan accordingly.

12. Other Taxes and Royalties

12.1. **Income Tax and surcharges over Income Tax etc**. at the rates fixed by the Ministry of finance, Government of India, shall be deducted from all the running and final bills of the contractor. Should there be any increase in rate of Income Tax and surcharge during execution of the contract, the same shall be payable by the contractor.

12.2. **Works Contract Sales Tax** as prevalent as per statutory orders of State/Central Government and shall be charged on gross value of all the bills and shall be recovered from each bill of the contractor as 'works contract sales tax'. Should there be any increase in rate of Works Contract Sales Tax during execution of the contract, the same shall also be payable by the contractor.

12.3. **Royalty** shall have to be paid by the contractor on all materials such as stone, bricks, boulders, metal, shingle, bajri, stone aggregate, coarse sand and fine sand etc. or any other materials used for the execution of the work direct to the Revenue Authority of the District/State Govt. concerned. The contractor shall obtain "No Demand" certificate from the District/State Govt. authority concerned before the final bill is paid, failing which necessary recovery will be effected at the applicable rates in the final bill.

13. Secured Advance:

13.1. Secured advance on bricks, stone, stone aggregate brought at site for use in the work shall be paid only after receipt of satisfactory test results from the laboratory and provisions under rules.

13.2. Secured advance on steel doors, steel windows, etc. shall be paid only after the Engineer-in-Charge has personally verified that the materials brought at site of work, for use in work, conforms to the sample approved by him.

13.3. Secured advance whenever admissible on water supply, sanitary installation materials and fittings shall be allowed only after the Engineer-in-Charge has verified that materials brought at site have been checked by him personally and are in conformity with the samples approved by him.

13.4. Secured advance for terrazzo tiles shall be paid only after satisfactory results are received from the laboratory.

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B. ADDITIONAL SPECIFICATIONS

1. GENERAL

1.1. The Work shall, in general, conform to the CPWD Specifications. The CPWD specifications shall mean CPWD Specifications – 1996 Vol. 1 to VI with up-to-date correction slips and Revised CPWD Specifications 2002 for Cement Mortar, Cement Concrete and RCC works which supersede Chapter 3,4 & 5 of CPWD specifications 1996 Vol.II.

1.1.1. Should there be any difference between the specifications mentioned above and the specifications given in the schedule of quantities, the later shall prevail.

1.1.2. If the specifications for any item are not available in the CPWD Specifications cited above, relevant BIS Specifications should be followed.

1.1.3. In case BIS Specifications are also not available, the decision of Engineer-in-Charge given in writing based on acceptable sound engineering practice and local usage shall be final and binding on the contractor.

1.1.4 Articles classified as first quality by the manufacturer shall be used unless otherwise specified.

1.2. The work will be carried out in accordance with the architectural drawings and structural drawings to be issued by the Engineer-in-Charge. The structural and architectural drawings shall have to be properly correlated before executing the work.

1.2.1. Incase of any difference noticed between Architectural and Structural drawings, the contractor shall obtain final decision in writing of the Engineer-in-Charge.

1.2.2. In case of any discrepancy in the item given in the schedule of quantities appended with the tender and architectural drawings relating to the relevant item, former shall prevail unless otherwise given in writing by the Engineer-in-Charge

1.3. For items where so desired, samples shall be prepared before starting the particular items of work for prior approval of the Engineer-in-Charge and nothing extra shall be payable on this account.

1.4. Materials brought at site of work shall not be used in the work before getting satisfactory Mandatory test results. For details, relevant provisions in the CPWD specification shall be referred to.

1.4.1. Wherever it is desired to procure factory-made materials, such factory-made materials shall be procured from reputed and approved manufacturers or through their authorized dealers. The contractor shall obtain the approval from the Engineer-in-Charge of such firms prior to procurement of such factory-made materials. The Engineer-in-charge may, at any stage, inspect such factories/ manufacturing units. The contractor shall have no claim if the factory made materials brought to the site are rejected by the Engineer-in-charge in part or in full due to bad workmanship/ quality etc. even after the inspection of the manufacturing units.

1.4.2. The manufactured materials brought at site of work shall, in general, conform to the relevant specifications. The source for supply of the manufactured materials shall be approved by the Engineer-in-charge. The contractor shall have no claim if the manufactured materials brought to the site are rejected by the Engineer-in-charge in part or in full due to bad workmanship/ quality etc.

1.4.3. The preference amongst the various alternative materials available shall be as follows: -

(a) The materials shall be as per the Brand specified to be used in the work.
(b) If the Brand specified material is not available then the material shall be ISI marked.
(c) If ISI marked item is not available then it should be from ISO certified Company.
(d) If the ISI marked or ISO certified items are not available then the best available items in the market to be procured.

1.4.4. Equivalents for the various materials and the materials of approved make shall be got approved from the Engineer-in-Charge of work in writing before using them on the work.

1.4.5. The contractor shall maintain register for cement, paint and other registers as required by the Engineer-in –charge and those should be signed by the contractor or his authorized agents and the Asst. Project Engineer in charge of the work.

2. The following modifications to the above specifications shall, however, apply.

2.1. **Earth Work**

2.1.1. During excavation and trenching work etc., the contractors shall ensure compliance to the guidelines in such matters laid down by the local body / bodies to ensure that there is minimum hazard to the operating personnels and users, minimum inconvenience to the users, minimized damage to the underground plant/services of other utilities in a coordinated way, in the interest of public convenience and overall safety.

2.1.2. Any trenching and digging for laying sewer lines/ water lines/ cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

2.1.3. Surplus excavated earth which is beyond the requirement of the H.L.L shall have to be disposed of by the contractor at his own cost beyond the municipal limits or at places identified by the local bodies or as directed by the Engineer-in-Charge after obtaining written permission of the Engineer-in-Charge and no payment will be made by the Department for such disposal of this surplus excavated earth.

2.1.4. The contractor shall, at his own expense and without extra charges, make provision for all shoring, pumping, dredging or bailing out water, if necessary, irrespective of the source of water. The foundation trenches shall be kept free from water while all the works below Ground Level are in progress, without any extra payment.

2.2. **Reinforced Cement Concrete Work & Plain Cement Concrete- General**

2.2.1. **Stone Aggregate**. Stone aggregate to be used in the work shall be of hard broken stone to be obtained from source approved by Engineer-In-Charge and shall conform to the relevant provisions in the CPWD Specifications.

2.2.2. **Fine Sand** / **Coarse Sand**: Fine sand / Coarse sand to be used in the work shall be obtained from sources approved by Engineer-In-Charge and shall conform to the relevant provisions in the CPWD Specifications.

2.2.2.1. Where only one variety of sand is available, the sand will be sieved for use in finishing work to achieve the required particle size distribution as per CPWD Specifications in order to obtain smooth surface and nothing extra shall be paid to the contractor on this account.

2.2.3. **Water: -** It shall conform to requirements laid down in IS: 456-2000 and CPWD Specification

2.3. **R. C. C. work (Design Mix Concrete) -** Wherever the RCC work is specified to be done with Design Mix Concrete, the particular specifications, as applicable, shall apply.

2.4. **R.C.C.Work (Nominal mix concrete)- Water-Cement Ratio: -** For RCC Works, wherever nominal mix of concrete is stipulated in the items for work, for maintaining proper quality and durability requirements of the structure, maximum water-cement ratio shall be restricted to 0.55. If in normal course of work, the required workability is not achieved; suitable plasticizers/ admixtures may be used for improving the workability of concrete with the approval of Engineer-in-Charge for which nothing extra shall be paid.

2.5. **Non-destructive Testing for Concrete/R.C.C Work: - The** Engineer-in-charge shall, at his discretion, get the non-destructive testing (Such as Ultrasonic Pulse Velocity Test etc.) done and the Contractor shall make all necessary arrangements for getting such tests done and make good the same after the test, for which nothing extra shall be paid. The results of such tests shall be binding on the Contractor. In case of non-conformity of the test to the standards, the contractor shall be liable to re-do the concrete work at his cost including the cost of test, subject however, to the acceptability of the work as laid down in the mandatory test defined in the relevant CPWD specifications.

2.6. Cement slurry, if any, added over base surface (or) for continuation of concreting for better bond is deemed to have been in built in the items (Unless other wise explicitly stated) and nothing extra shall be payable (or) extra cement considered in consumption on this account.

2.7. **Centring and Shuttering For R.C.C Work:-** The concrete surface shall be free from honey combing, offsets, superfluous mortar, cement slurry and foreign matter. The formwork shall be assembled in such a way as to facilitate removal of their parts in proper sequence without any damage to the exposed cement concrete surfaces and corners etc. The contractor shall keep skilled staff for special care and supervision to check the formwork and concreting so that every member is made true to its size, shape, level and alignment so that it does not result in any deformation, snug, buldges etc. The contractor shall also take suitable precautionary measure to prevent breaking and chipping of corners and edges of completed work until the building is handed over. The size of shuttering plates for slabs shall not be less than 0.6mx0.9m in general. However, contractor has to provide tape or wooden fillets or rubber gaskets to seal the joint properly to get smooth surface. Further shuttering shall be of such quality that there are no undulations and surfaces will be fairly even and no extra thick ceiling plaster shall be permitted to make the surface even. Any honey-combed or poorly formed concrete shall be repaired with polymer concrete of any suitable design by the Contractor at his own cost, in accordance with the specifications laid down in hand book of Repairs and Rehabilitation of RCC Buildings by CPWD.

2.8. **BRICK WORK**: - Bricks used in the work shall be of class designation specified to be obtained from kilns approved by Engineer-In-Charge. In all other respects they shall conform to the provisions in CPWD specifications.

2.9. **STONE WORK**: Stone used for stone masonry work shall be hard granite/ basalt/ quartz stone/sand stone to be obtained from quarries approved by Engineer-In-Charge and shall conform to the relevant provision in the CPWD specifications.

2.10. All above materials like stone aggregates, coarse sand, fine sand, Bricks, Surkhi, Stone etc. confirming to the CPWD specifications to be brought from the sources approved by Engineer-In-Charge. In case, at any stage during execution of work, the material from the approved source being not available or otherwise, and, is required to be arranged from other sources conforming to relevant CPWD specifications and duly approved of Engineer-in-charge, involving extra lead etc. nothing extra shall be paid on this account.

2.11. **WOOD WORK: -** Timber required for manufacture of chowkhats and shutters for doors, windows, ventilators, and partitions etc. in the work shall be kiln seasoned and preservative treated. The Timber shall be kiln seasoned before applying preservative treatment. The rate quoted for various items shall be inclusive of kiln-seasoning and preservative treatment of wood. The wood used in the work shall conform to the provisions in the CPWD Specifications for works.

2.12. **FACTORY MADE SHUTTERS etc.:-** The shutters for doors, windows & ventilators, and, chowkhats etc. shall be factory made and obtained from suppliers approved by the Engineer-in-charge.

2.13. **STEEL WORK:-** All steel doors, steel windows, steel ventilators, wire gauge, steel glazing, steel grill shall be according to the Architect's detailed drawings and factory made and obtained from approved suppliers.

2.13.1. In the case of composite steel windows the rates shall include the cost of coupling mullion and transom etc. Where windows with inside openable shutters are fixed along-with windows with shutters openable outside, such inside openable windows shall be fitted with suitable friction hinges and openable outside with box type hinges, lever handles or otherwise as approved by the Engineer-in-Charge of the work. For such windows, cement concrete blocks of size 15cmx 10cmx 10cm shall be provided. Nothing extra shall be paid on this account.

2.13.2. In the case of steel windows and doors, steel glazing, wire gauge steel ventilators, rolling shutters, grills etc. an approved quality-priming coat of zinc chromate shall be applied over and above shop coat of primer. Nothing extra shall be payable for providing shop-coat primer.

2.14. **Sanitary and Water supply installations**

The contractor shall engage licensed plumber for sanitary, water supply, drainage work and shall be carried out in a manner complying in all respects with the requirement of relevant by laws of the local municipal authority. The Contractor shall give a guarantee to the effect that the work shall remain structurally stable and shall guarantee against faulty workmanship, finishing, manufacturing defects of materials and leakages etc. The Contractor shall furnish a Guarantee Bond, as per prescribed format. The Guarantee Period shall be for 10(Ten) years.

2.15. **Approval of sample work** of repetitive/ typical nature prior to general execution of work shall be as enumerated hereafter.

2.15.1.1. Samples of typical portion of the works of repetitive nature such as typical room, toilet room, or any other work shall be prepared by the contractor under the directions and to the satisfaction of Engineer-in-Charge and got approved from him in writing before the commencement of these items for the entire work.

2.15.1.2. The work shall be so arranged to be carried out that the requirement for preparation of samples are observed and fulfilled without any detriment to the general progress of work. In other words, this will not be allowed to have any effect on the general progress of work or on any of the terms and conditions of the contract. No claims of any kind whatsoever including the claim of extension of time will be entertained due to the incorporation of this requirement.

2.16. **TEST RESULTS & RELATED ASPECTS**

2.16.1. Normally, part-rate payment shall be allowed in the running account bills only if the materials conforming to the CPWD specifications for works as mentioned in the work are used and test results are awaited by the Engineer-in-Charge.

2.16.2. The Engineer-in-Charge of work shall check the test results and satisfy himself before allowing any payment in the running/final bill.

2.17. **WATER PROOFING**: -

2.17.1. **Treatment for roof surfaces: -** The treatment of Roof Surfaces, wherever done with integral cement based compound (Brick-coba), the particular specifications shall be applicable.

2.17.2. The Contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-charge, for execution of water proofing treatment. The contractor shall furnish a Guarantee Bond, as per prescribed format, from the specialized firm and duly counter-signed by the contractor as a token of overall responsibility. The Guarantee Period shall be for 10(Ten) years.

2.17.3. Ten percent of the cost of items of water proofing treatment for sunken floors and on roofs would be retained as guarantee to watch the performance of the work done. However half of the amount withheld would be released after (5) five years, if the performance of the work done is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days, and if' not attend to, the same will be got done from another agency at the risk and cost of the contractor. However this security deposit can be released in full, if bank guarantee of equivalent amount for 10(ten) years after completion of maintenance period is produced and deposited with the HLL.

C. PARTICULAR SPECIFICATIONS

1.1. **R. C. C. WORK (DESIGN MIX CONCRETE)**

1.1.1. The RCC work shall be done with Design Mix Concrete unless otherwise specified. In the nomenclature of items, wherever letter M has been indicated, the same shall imply for the Design Mix Concrete. For the nominal mix in RCC, CPWD specification shall be followed. The Design Mix Concrete will be designed based on the principles give in IS: 456, IS: 10262 and SP 23. The contractor shall design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. The cement shall be actually weighed, as presumption of each bag having 50kg shall not be allowed. In case of use of admixture, the mix shall be designed with these ingredients as well. The specification mentioned therein below shall be followed for Design Mix Concrete.

1.1.2. **Admixture: -** Wherever required, admixtures of approved quality shall be mixed with concrete to achieve the desired workability within specified water cement ratio. The admixture shall conform to IS: 9103. The chloride contents in the admixture shall satisfy the requirement of BS: 5075. The total amount of chlorides in the admixture mixed concrete shall also satisfy the requirements of IS: 456-2000.

1.1.2.1. The contractor shall not be paid anything extra for admixture required for achieving desired workability without any change in specified water cement ratio for RCC/CC work.

1.1.3. **Grade of concrete: -** The characteristic compressive strength of various grades of concrete shall be given as below: -

Sl. No.	Grade / Designation	Compressive strength on 15cm cubes min 7days (N/mm2)	Specified characteristic compressive strength at 28 days (N/mm2)	Minimum cement content (kg per cum)	Maximum water cement ratio
(i)	M 25	As per Design	25	360	0.50
(ii)	M 30	As per Design	30	400	0.45
(iii)	M 35	As per Design	35	410	0.45

1.1.3.1. The Concrete mix will be designed for minimum workability as specified in para 7 of IS-456-2000. Workability of Concrete (Unless otherwise specified elsewhere or as decided by Engineer- in-charge.

Placing Conditions	Degree of Workability	Slump (mm)
(1)	(2)	(3)
Lightly reinforced sections in, slabs, beams, walls columns	Low	25-75
Heavily reinforced section in slabs, beams, walls, columns	Medium	50-100
Pumped concrete	Medium	75-100

1.1.3.2. In the designation of concrete mix letter M refers to the mix and the number to the specified characteristic compressive strength of 15cm-Cube at 28 days expressed in N/mm2.

1.1.3.3. It is specifically highlighted that in addition to the above requirements the maximum cement content for any grade shall be limited to 450kg/ cubic metre.

1.1.3.4. The Minimum / Maximum cement content for design mix concrete shall be maintained as per the quantity mentioned above. Even in the case where the quantity of cement required is higher than the minimum specified above to achieve desired strength based on an approved mix design, nothing extra shall become payable to the contractor. In case of pile work, cement content will be as specified (Minimum 400kg/Cum of concrete).

1.1.3.5. The concrete design mix with or without admixture will be carried out by the contractor through laboratories/ Test houses of repute as decided by EE/SE.

1.1.3.6. The various ingredients for mix design/ laboratory tests shall be sent to the lab/ test houses through the Engineer in charge immediately after award of work and the samples of such aggregate sent shall be preserved at site by the department. The admixture if used by contractor shall be at his own cost without any extra payment.

1.1.4. The Contractor shall submit the mix design report from any of above approved laboratories for approval of Engineer in charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the mix design is approved.

1.1.5. In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of Engineer in charge.

1.1.6. **Approval of Design Mix:-**

The mix design for a specified grade of concrete shall be done for a target mean compressive strength Tck = Fck +1.65s

Where Fck = Characteristic Compressive Strength at 28 day

s = Standard deviation which depends on degree of quality control.

The degree of quality control for this work is "good" for which the standard deviation (s) obtained for different grades of concrete shall be as follows:-

GRADE OF CONCRETE	FOR 'GOOD' QUALITY OF CONTROL
M – 25	5.3
M -30	6.0
M –35	6.3

1.1.6.1. Out of the six specimen of each set, three shall be tested at seven days and remaining three at 28days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28days.

1.1.6.2. All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.

1.1.7. **Batching, Mixing, Transportation, Placing, and, Compaction:**

1.1.7.1. The Concrete shall be sourced from on site batching and mixing plant conforming to IS: 4925, it shall have the facilities of presetting the quantity to be weighed with automatic cut off when the same is achieved. Transportation and placing of concrete shall be with transit mixes and concrete pump respectively or with tower cranes depending upon site condition and nothing extra shall be paid. In certain places/ location placing of concrete may be permitted manually. Accuracy of measurement shall be as specified is IS - 456-2000.

1.1.7.2. All other operations in concreting work like mixing, Slump, Laying/Placing of concrete, compaction, curing etc. not mentioned in this particular specification for Design Mix of Concrete shall be as per Revised CPWD Specification 2002 for CM, CC and RCC work, IS- 456-2000 and Additional/Special Condition forming part of this tender document.

1.1.8. **Preparation of Mixes As Per Approved Design Mix Conducting Confirmatory Test at Field Lab**.

1.1.8.1. The contractor shall make the cubes of trial mixes as per approved Mix design at site laboratory for all grades, in presence of Engineer in charge using sample of approved materials proposed to be used in the work prior to commencement of concreting and get them tested in his presence to this entire satisfaction for 7 days and 28 days. Test cubes shall be taken from trial mixes as follows.

1.1.8.2. For each mix, a set of six cubes shall be made from each of three consecutive batches. Three cubes from each set of six shall be tested at age of 7 days and remaining three cubes at age of 28 days. The cubes shall be made cured transported and tested strictly in accordance with specifications. The average strength of nine cubes at age of 28 days shall exceed the specified target mean strength for which design mix has been approved; the evaluation of test result will be done as per IS-456-2000.

1.1.9. **Work Strength Test- Test Specimen**

1.1.9.1. Work strength test shall be conducted in accordance with IS: 516 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days. Additional samples shall be prepared if required, as per direction of Engineer in charge for testing samples cured by accelerated method as described in IS: 9103.

1.1.10. **Test Result of Sample**

1.1.10.1. The test results to the sample shall be the average of the strength of three specimens. The individual variation shall not be more than +/-15 percent of the average. If more the test results of the sample are invalid. 90% of the total tests shall be done at the laboratory established at site by the contractor and remaining

10% in the laboratory of Central Designs Organization, CPWD or any other laboratory as directed by the Engineer in charge.

1.1.11. **Standard For Acceptance**

1.1.11.1. Standard of acceptance shall be same as specified in clause 16 of IS-456-2000

1.1.11.2. In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specification, the level of top surface of RCC shall be accordingly adjusted at the time of its centring, shuttering and casting for which nothing extra shall be paid to the contractor.

1.1.12. **Measurement:-** As per CPWD specifications.

1.1.13. **Tolerance:-** As per CPWD specifications.

1.1.14. **Rate:-** The rate includes the cost of materials and labour involved in all the operations described above except for the cost of centring, shuttering and reinforcement, which will be paid separately.

1.1.14.1. In case of actual average compressive, strength being less than specified strength which shall be governed by para 'Standard of Acceptance' as above, the rate payable shall be worked out accordingly on prorata basis.

1.1.14.2. In case of rejection of concrete on account of unacceptable compressive strength, governed by para 'Standard of Acceptance' as above, the work for which samples have failed shall be redone at the cost of contractors. However the Engineer in charge may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test of structure or part of structure etc) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer in charge without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube tests results and reduced rates shall be regulated in accordance with para 5.14.13 of Revised CPWD specification 2002 for C.M., C.C. and R.C.C. works.

1.2. **Treatment for roof surfaces: -**

For treatment of Roof Surfaces with integral cement based compound (Brick-coba), following specifications shall be applicable. This item shall be got executed from specialized agency to be got approved from Engineer-in-charge: -

1.2.1.1. The bricks bats shall be from over burnt bricks. The proprietary water-proofing compound shall bear I.S.I. mark and shall conform to IS: 2645. Before execution of work water proofing compound has to be brought to and a certificate of its conforming to IS code should be produced. The proprietary water-proofing compound shall be added at the rate recommended by the specialist firm but not exceeding 3 percent by weight of cement. The Engineer in charge reserve the right to collect the random sample from material brought at site and get it tested

from laboratory of his choice. The material which does not conform to the specification shall have to be removed forthwith by the contractor.

1.2.1.2. The finished surface after water proofing treatment shall have minimum slope of 1 in 80. At no point shall the thickness of water proofing treatment be less than 65mm.

1.2.1.3. While treatment of roof surface is done, it shall be ensured that the outlet drain-pipes have been fixed and mouths at the entrance have been eased and round off properly for easy flow of water.

1.2.1.4. The surface where the water proofing is to be done shall be thoroughly cleaned with wire brushes. All loose scales mortar splashes etc. shall be removed and dusted off. The surface shall be treated with neat cement slurry admixed with proprietary water proof compound to penetrate into crevices and fill up all the pores in the surface. The cement slurry shall be applied at the junction of parapet and terrace slab including the vertical face of the parapet.

1.2.1.5. After the slurry coat is laid, layer of over burnt brick bats shall be laid in cement mortar of mix as specified by specialist firm but not leaner than 1:5(1cement: 5coarse sand) admixed with proprietary water proofing compound to required gradient and joints filled to half the depth. The bricks bat layer shall be rounded at the junctions with the parapet and tapered towards top for a height of 300mm curing of this layer be done for 2 days.

1.2.1.6. After curing the surfaces shall be applied with a coat of cement slurry admixed with proprietary water proofing compound.

1.2.1.7 Joints of bricks bat layer shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (1cement:5 coarse sand)admixed with proprietary water proofing compound and finally top finished with average 20mm thick layers of cement mortar:1 :4 (1cement:4 coarse sand) and finished smooth with cement slurry mixed with proprietary water proofing compound. The finished surface shall have marking of 300x300mm false squares to give the appearance of tiles.

1.2.1.8 Curing of water proofing treatment shall be done for a minimum period of weeks by flooding the water by making kiaries etc.

1.2.2 **MEASUREMENTS:** The measurement shall be taken for plan area of terrace only. Length and breadth shall be measured correct to 1cm. And area shall be worked out to nearest 0.01sqm. No deduction in measurement shall be made for either opening or recesses for chimney, stacks roof lights and the like of area upto 0.01sqm not anything extra shall be paid for forming such openings. For similar areas exceeding 0.10 sqm, deduction will be made in measurements for full openings and nothing extra shall be paid for making such opening.

1.2.3 **Rates:** The rate shall include the cost of all labour and materials involved the all operations described above.

1.3 **CHECK LIST FOR QUALITY ASSURANCE:** For works with estimated cost Rs.10 Lakhs and above, quality Assurance Check list for Back Filling, Plain Cement Concrete, Shuttering, Reinforced Cement Concrete and Structural Steel fabrication as annexed shall form a part of the Tender Document. Compliance of this Quality Assurance Check List shall be before release of the payment.

LIST OF APPROVED MAKE OF MATERIALS

1.0 FOR CIVIL WORKS

Sl. No.	Details of Material/ Products		Manufacturer's Name
1.1	**Plywood**		Duroply (Green marked, BWR Grade) of Sarda Plywood Industries Ltd. Century Plywood Green Plywood Kitply
1.2	**Blockboard**		Duroboard (Green marked, BWR Grade) of Sarda Plywood Industries Ltd. Green Plywood, Ashwani Sarda, F4, Dhawandeep Building, 6 Jantar Mantar Lane, New Delhi, Ph. 011-23748424/25/26/27/28) Century Plywood, E-5, Kalkaji, Main Road, New Delhi-19, Ph. 011-26474434 Kitply Industries Ltd.
1.3	**Veneers**		Sarda Plywood Industries Ltd., Green Plywood, Century Plywood, Kitply Industries Ltd.
1.4	**Adhesive**		Pidilite, 93, New Rajdhani Enclave, Vikas Marg, Delhi-92, Ph. 011-2203118, 2430170 Araldite & equivalent
1.5	**Flush Doors**		Samrat, Kanchan Prima, Swastik (Kitply), Century
1.6	**Plastic Laminates**		Formica, Neoluxe, Greenlam Bakelite Hylam, 28-A, IInd Floor, Defence Colony Market, New Delhi –24, Ph. 4623393, 4625935
1.7	**Steel Door**		Raymus Stracturals and Engineering Pvt. Ltd. Plot No. 406, 457, Phase-III, Udyog Vihar,

Sl. No.	Details of Material/ Products		Manufacturer's Name
			Gurgaon, Fax No. 0124-2346050 Shakti Met Door
1.8	**Aluminium Sections**		India Aluminium Co. / Hindustan Aluminium / Jindal, Bharuka
1.9	**Powder Coatings**		Berger / Nerocoat / Jenson & Nicholson
1.10	**Tile Joint Filler**		Bal Adhesives & Grouts / "Roff Rainbow Tile Mate" of Roff Construction Chemicals Pvt. Ltd. / Winsil 20 / Silicon Sealant of GE Bayer Silicon / "Zentrival FM" of MC – Bauchemie (India) Pvt. Ltd.
1.11	**PVC Tile Spacers**		Kajaria Ceramic Limited, J-1/B-1 (Ext.) Mohan Cooperative Industrial Estate, Mathura Road, Ph. 26946409, 26946411, 26949524
1.12	**Heavy Duty Chequered Tiles**		NITCO, 2308, Behind Kali Masjid, Chowk Prajapat, Delhi 110006 – Phone : 2048473 Modern Tiles, Hindustan Tiles
1.13	**Ceramic Tiles**		Kajaria / Spartek Morbito, Orient Nittco, Euro Somany/Rustico/Azure
1.14	**Vitrified Tiles**		Asian, Naveen, Somany Nitco Aaren Industries, F-31, Hauz Khas, Main Road, Opp. Telephone Exchange Euro 208, Sangam Arcade,Vallabhai Road, Vile Parle (W), Mumbai – E-mail : eurovitrified.com Oracle Granito Ltd.
1.15	**Mineral Fibre**		Armstrong World Industries (I) PVt. Ltd. A-31, Naraina Indl. Area, Phase-I,

Sl. No.	Details of Material/ Products		Manufacturer's Name
	Suspended Ceiling		New Delhi – 110028 - Phone : 25893262 AMF perforated ceilings Ecoflex Atek Mineral Fibre India Pvt. Ltd. 495 Double Storey, Kalkaji, New Delhi 19 Ph : 11-51604860 Everest Industries Limited HS-37, 2nd Floor, Kailash Colony Market, New Delhi 110048 – Phone : 41618660
1.16	**Calcium Silicate Suspended Ceiling**		Aerolite Ceiling Systems Plot No.-2, Phase-V, IDA, Jeedimetla, Hyderabad – 500 055 Phone : 040-23449240 Promat International (Asia Pacific) Ltd. S-5, Second Floor B-87, Defence Colony, New Delhi – 110 024. Ph. : 011-2469 1594, Fax :011 -2469 2064 E-mail: raman@promat.com.my
1.17	**Resin Bonded Glass Wool**		U.P. Twiga Fibreglass Limited / Crown Fibreglass / Rockloyd
1.18	**MS Tubes**		Tata 917, International Trade Tower, Nehru Place, New Delhi 110019 Lloyd Metal & Engineering Co. / NSL Limited
1.19	**Roof Waterproofing**		RB Waterproofing, India Waterproofing, CICO, SIKA, Structural Waterproofing Co. Pvt. Ltd.
1.20	**Expansion / Scismic Floor / Wall Joints Cover**		"No Bump" Multipurpose floro systems Plot No. 4, Kehar Singh Estate, Westend Marg Saidulajab, MB Road, New Delhi – 110 030 Ph. : 011 4166 4480, 4166 4478, 2953 5899 Fax : 011-2953 3733, E-mail : info@tristarintech.com McCoy Silicones Ltd. (C/S Group) Giesse (Acovyn Wall Covers) 8, M.M. Road, Motia Khan, New Delhi-55, Ph: 011-23513003 Fax:011-23513007,

Sl. No.	Details of Material/ Products		Manufacturer's Name
			E-mail: tekgroup@vsnl.com
1.21	**Silicon Sealants**		GE Bayer Silicone Cross Road, Off 132 Ft, Ring Road, Ahmedabad – Ph. : 079-26748476 Sika G-75, Kalkaji 110019, Ph. : 26464823 Dow Corning / Waclear
1.22	**Paints**		ICI / Berger / Jenson & Nicholson/Asian Paints
1.23	**Textured Paints**		Spectrum C-1/106, Lajpat Nagar, New Delhi Ph : 29816587, 29816791, 29818345 Unitile Texture Unitile House, 3/35, Punjabi Bagh, New Delhi 110026, Phone : 25221877, 6599981
1.24	**Wax Polish**		Reckitt & Colman or equivalent
1.25	**Modular Stainless Steel Railings**		Dline India Pvt. Ltd. Oberoi Garden Estate, 3rd Floor, 'A' Wing, Chandivali Farms Road, Andheri (East) Cavallier Interior Craft, Ph : 26846809 Jindal Dormat India Pvt. Ltd. International Division A-181, Vikaspuri, New Delhi – 110 018 9810012361 (M), Fax No. 011-2550 5617 Connect Architectural Product Pvt. Ltd. B-5, Sector-81, Phase-II, Noida Mobile : 9871481811
1.26	**Fire Check Steel Doors**		Godrej 379-A, Chirag Delhi, Sheikh Sarai, New Delhi –

Sl. No.	Details of Material/ Products		Manufacturer's Name
			Ph : 26444300 Sukri 380, Chirag Delhi, New Delhi – Ph : 29250694 Pacific Fire Controls Phone : 23674884
1.27	**Interlock Paving Tiles**		Unistone Unitile House, 3/35, Punjabi Bagh, New Delhi 110026 Hindustan Tiles 601, 602, Suneja Tower, Janakpuri Dist. Centre, New Delhi – Phone : 25532481 Nimco Prefab 57/11, 1st Floor, Old Rajinder Nagar, New Delhi - Phones : 25781059, 25814818
1.28	**Non Metalic Hardner**		STP, Fosroc or equivalent
1.29	**Anchor Fastener**		HILTI, BOSCH
1.30	**Formwork Release Agent**		FOSROC, MBT, MC Baucheme, CICO, Ado Conmat
1.31	**Ready Mix Concrete (RMC)**		ACC, Unitech Grasim Industries Ltd. 2nd Floor, DCM Bldg., 16, Barakhamba Road, New Delhi – Ph : 23356752 / 23356754 L&T, 5, Bikaji Cama Place, Somdatt Chamber-1, 3rd Floor, P.O. Box 5, R.K.Puram, New Delhi Ph : 26106639, 26170519 Or Equivalent
1.32	**Non shrink grout**		Fosroc Chemical (India)
1.33	**Bonding Coat**		CICO Bond EPO of CICO Nitibond EP pf M/s FOSROC OR Polyalk EP of Sunanda speciality coating Pvt. Ltd.
1.34	**Welding Electrodes**		ESAB Advani – Orlikon Weld Alloy

Sl. No.	Details of Material/ Products		Manufacturer's Name
1.35	**Horizontal Tie Bars / Shear**		BB Bars System, ETIC system
1.36	**Cement**		L&T, ACC, GRASIM, Birla, Ambuja as approved by Engineer-in-Charge
1.37	**Epoxy**		FOSROC, SIKA QUALCRETE, Araldite, MBT
1.38	**Admixtures**		FOSROC, MBT, Asian Lab, MC Baucheme, CICO Plast Super, Chembond, Sika
1.39	**Waterproofing System**		FOSROC, SIKA, SUPREME, SILTECH Chemicals, Krypton Buildmat Co., Ado Conmat
1.40	**Aluminium Fabricator**	(a) (b) (c)	Windorz India (P) Ltd. 806, Shakuntala Building, 59, Nehru Place, New Delhi 110019 Phone : 26283456, 41624899 M/s Alkarma Pvt. Ltd. Phone No. 011-25938525, 9810030901 Hindustan Alcox Ltd. 101, Janak Cinema Complex, New Delhi – 110058 Ph. 011-5555277 Or equivalent approved by Engineer-in-Charge
1.41	**Reinforcement Steel (TMT Bars)**	(a) (b) (c)	Steel Authority of India Ltd. Rashtriya Ispat Nigam Ltd. Tata Iron and Steel Company Ltd. Ist Floor, Jeevan Tara Building, 5 Sansad Marg, New Delhi – Ph : 23542646 Or equivalent as approved by the Engineer-in-Charge
1.42	**Wooden Laminated Flooring**		KRONO, Quick Step M/s M.R.Carpets Pvt. Ltd. Phone : 45401155 PERGO M/s Red Floor India UG-5, Ansal Chamber, Bhikaji Cama Place

Sl. No.	Details of Material/ Products		Manufacturer's Name
			New Delhi 110066 – Phone : 41658558
1.43	**Tile Joint Filler, Tile Fixing Adhesive, Polysulphide Sealant and Primer for Polysulphide**		M/s Pidilite Industries Ltd., or equivalent as approved by Engineer-in-Charge
1.44	**Gypsum False ceiling**		Gypsum India Ltd., 137, Sant Nagar, Delhi 110065 – Ph : 26236289 26236290 Beral Gypsum or equivalent as approved by the Engineer-in-Charge
1.45	**Float Glass**	(a)	Glaverbel, Saint Gobain, Modiguard, Floatglass India Ltd (Asahi), or equivalent as approved by the Engineer-in-Charge
1.46	**Toughened Glass**	(a)	GSC, Gold Plus Gold Plus House, G-192, Prashant Vihar, New Delhi 110085 – Ph : 27564007, 27565277 Sejal Gurind Toughened D-172, Okhla Industrial Area, Phase-I, New Delhi 110020 – Ph : 26819009 Or equivalent as approved by the Engineer-in-Charge
1.47	**Aluminum Sections, angles etc.**	(a)	Indalco, Hindalco, Jindal or equivalent
1.48	**Ironmongery for Aluminium Doors & Windows**	(a) (b)	Security Style/Alualpha, Conne Xions, 205, Balram House, Karampura, Commercial Compelx, New Delhi-15 Ph: 011-25920226-7, Fax:011-25920228 E-mail: info@lgfsysma.com Giesse/ Welka Lock McCoy Silicones Ltd. (C/S Group)

Sl. No.	Details of Material/ Products		Manufacturer's Name
			8, M.M. Road, Motia Khan, New Delhi-55, Ph: 011-23513003, 9813800117(M) Fax:011-23513007, E-mail: tekgroup@vsnl.com

LIST OF APPROVED MAKES OF SANITARY AND PLUMBING MATERIALS

SL. NO.	MATERIALS	BRAND NAME
1.	INDIAN/EUROPEAN CLOSET/ WASH BASIN	SOMANY/AQUAWARE/HINDWARE/ PARRYWARE/ORIENT (CORAL)
2.	PLASTIC W.C. SEATS	COMMANDER/ DIPLOMAT/ADMIRAL
3.	STAINLESS STEEL SINKS	PRESTIGE/A.M.C./JAYNA/ KINGSTON NEELKANTH
4.	C.P. FITTINGS & ACCESSORIES & FLUSH VALVES	GEM/PARKO/JAQUAR/ KINGSTON
5.	C.P. WASTE, SPREADERS, URINAL	ORIENT/PARKO/JAQUAR
6.	SENSOR OPERATED AUTO FLUSHING SYSTEM URINALS	PARRYWARE/HINDWARE/ SEABIRD/ORIENT(CORAL)
7.	HAND DRIER	KOPAL
8.	SOIL, WASTE & RAIN WATER PIPES & FITTINGS	
	A) CAST IRON PIPES (IS:3989)	NECO/B.C./RIF
	B) CENTRIFUGALLY CAST SPUN CAST IRON PIPES (IS:1536)	ELECTROSTEEL/ KESORAM/IISCO

9.	RCC PIPES	INDIAN HUME PIPE/ PRAGATI CONCRETE UDYOG
10.	G.I. PIPES	TATA/ JINDAL HISSAR
11.	G.I. FITTINGS MALLEABLE CAST IRON)	R/KS / UNIK
12.	GUN METAL VALVES (FULLWAY, CHECK AND GLOBE VALVES)	ZOLOTO / LEADER / SANT
13.	C.I. VALVES (FULLWAY, CHECK AND GLOBE VALVES)	KIRLOSKAR / SANT
14.	WATER METERS	CAPSTAN/KRANTI/ANAND
15.	BALL COCKS	GPA/SANT/L & K
16.	STONEWARE PIPES & GULLY TRAPS	PERFECT/BURN/RK
17.	C.I. MANHOLES COVERS AND FRAMES	NECO / R.I.F. / B.C.
18.	HORIZONTAL CENTRIFUGAL PUMPS	KIRLOSKAR/BEACONS/ HBD-BOMBAY
19.	SUBMERSIBLE DRAINAGE PUMPS	KSB/KISHORE
20.	ELECTRIC MOTORS	KIRSLOSKAR/GEC/SIEMENS
21.	ELECTRICAL SWITCHGEAR & STARTERS	SIEMENS/L&T/ENGLISH ELECTRIC
22.	CABLES	(REFER TO ELECTRICAL SPECIFICATIONS)
23.	LIQUID LEVEL CONTROLLERS LIQUID LEVEL INDICATORS	MINILEC
24.	FILTRATION PLANT/ SOFTENING PLANT	ION EXCHANGE/THERMAX / PENTAIR

25.	PIPECOAT	INTEGRATED WATER PROOFING
26.	SFRC MANHOLE COVERS	KK / S K PRECAST CONCRETE
27.	UPVC PIPES/ FITTINGS	SUPREME/ PRINCE / FINOLEX
28.	MIRROR	ATUL/ MODI FLOT/GOLDEN FISH

LIST OF APPROVED MAKES FOR ELECTRICAL AND SUBSTATION

S.No.	MATERIALS	MANUFACTUERS / AGENCIES
1.	H.T Panel	Crompton /ABB / Alsthom / Siemens
2.	Transformer	Crompton /Kirloskar /Voltamp / Alsthom / (DRY, Cast Resin) / BHEL / Universal
3.	Bus trunking / Rising mains	(Along with all accessories) L&T / Schneider / GE / Control & Switchgear
4.	LT Panels	GE / ABB / L&T / Siemens/ Schneider
5.	ACBs	Same as (4)
6.	MCCBs	Same as (4)
7.	MCBs with DBs	Legrand /Hager / Alsthom/ Merlin Gerin/ Havels / Standard / Indo-asian
8.	Accessories of HT /LT Panels	As per manfacturer's specified make
9.	HT / LT UG cables	Cable corporation/Universal/Gloster/ Havells / NICCO /Polycab
10.	Wiring cables	Polycab / Havells / RR Kables / Finolex
11.	Switches (SFU)	GE / ABB / L&T / Siemens/ Schneider
12.	Modular Switches or Boxes	Legrand / Carbtree / Ess Esskay (signature) / MK /clipsal / Northwest
13.	Piano Type switches and Accessories	Anchor / Leader
14.	Cubicle Type Fuse	Siemens / GE / L&T/ABB/ Schnider

	Unit	
15.	SFUs/Isolators	Siemens / GE / L&T / ABB/ Schnider
16.	Starters /Contractor /Bi metal Relay	Siemens / L&T / ABB
17.	Push Button /Indicating Lamps (LED Type)	Siemens / L&T / ABB
18.	CTs	Kappa
19.	Control Fuse Base with HRC Fuse	GEC / Alsthom
20.	Selector Switch	Salzer
21.	Measuring Instruments	AE / IMP / Rishab
22.	MS Conduit	Supreme / BEC / NIL / or any Other ISI marked
23.	PVC Conduit	Precision / Avon Plast / Clipsal
24.	Accessories for PVC conduit	Precision / Clipsal / Avon Plast
25.	Capacitors	Universal / Siemens / L&T / GE
26.	Relays	L&T / EE / GE
27.	Digital Meters	Enercon / Alacirity / L&T
28.	Jointing Kits	Rey Chem / 3M Birla
29.	AC Units	Blue Star, Volts, Carrier

NOTE: In all cases of procurements, the contractor shall submit his proposal of procurement of materials in the form of a submittal with material specification and product information brochures, samples etc and the final decision on a particular make shall always vest with the engineer-in-charge. In case specific makes are not mentioned for a material, contractor shall submit his proposal for reputed makes of

materials. No procurement shall be made and no material shall be brought to site without the prior approval of the Engineer-in-charge and the Engineer-in-charge will have the right to ask the contractor to remove any such material brought to site and the contractor is bound to obey any such orders within 24 hours.

TABLE FOR WEIGHT (Kg/m) FOR REINFORCEMENT BARS

Steel reinforcement shall be measured and paid for on the basis of theoretical standard weight of different sizes of bars, irrespective of the actual weights as per table given below (up to 3 digits as per CPWD Table.)

Dia (mm)	Weight (kg/m)
6	0.222
8	0.395
10	0.617
12	0.888
16	1.579
18	1.999
20	2.467
22	2.985
25	3.856
28	4.836
32	6.316
36	7.986
40	9.869
45	12.490
50	15.424

Contractor's name

BILL OF QUANTITIES

Appendix - E

SUMMARY

SL. NO.	DESCRIPTION	ESTIMATED AMOUNT	
		Schedule items	Non schedule items
1	CIVIL WORKS	8,275,445.73	-
2	PLUMBING WORK	465,852.35	-
3	WATER TANK	255,364.16	-
4	RAIN WATER HARVESTING	280,691.88	-
5	RETAINING WALL	638,173.37	-
6	ELECTRICAL WORKS	1,345,452.13	4,341,457.02
	TOTAL	**11260979.62**	**4341457.02**
	GRAND TOTAL	**15602436.64**	
		Say	**15602437.00**

(Rupees One Crore Fifty Six Lakhs Two Thousand Four Hundred and Thirty Seven only)

I hereby agree to execute the work

1

Schedule items : Estimated cost Rs.1,12,60,980.00 (Rupees One Crore Twelve Lakhs Sixty Thousand Nine Hundred and Eight only) at *estimated cost or at percentage ……... (……) *above/below.

2

Non schedule items : Estimated cost Rs.43,41,457.00 (Rupees Forty Three lakhs Forty One Thousand Four hundred and Fifty Seven only) at *estimated cost or at percentage …… (……) *above/below.

Note: * Strike the words whichever is not applicable

Signature of Contractor.