

HSCC (I) Ltd.
(A Govt. Of India Enterprise)

Tender

FOR

**Providing Maintenance work for HSCC (I) Ltd at
E-6(A), Sector-1, Noida**

**Technical Specification
Volume-II**

March 2007

HSCC (INDIA) LTD.

(Consultants & Engineers for Mega Hospitals & Laboratories
E-6(A), Sector-I, NOIDA (U.P.-201301 (INDIA))

TECHNICAL SPECIFICATIONS

CIVIL WORKS

1.0 GENERAL :-

- 1.01 The specifications and mode of measurements for Civil and Plumbing works shall be in accordance with C.P.W.D. specifications 1996 Volumes I to VI.

Unless otherwise specified in the nomenclature of individual item or in the specifications, the entire work shall be carried out as per the C.P.W.D. specifications with upto date correction slips upto the date of opening of tender.

- 1.02 For the item not covered under CPWD Specifications mentioned above, the work shall be executed as per latest relevant standards/codes published by B.I.S. (formerly ISI) inclusive of all amendments issued thereto or revision thereof, if any, upto the date of opening of tenders.

- 1.03 In case of B.I.S. (formerly I.S.I) codes/specifications are not available, the decision of the Engineer based on acceptable sound engineering practice and local usage shall be final and binding on the contractor.

- 1.04 However, in the event of any discrepancy in the description of any item as given in the schedule of quantities or specifications appended with the tender and the specifications relating to the relevant item as per CPWD specifications mentioned above, or in drawings the former shall prevail.

- 1.05 In general the building floor to floor height is 3.7m unless specified otherwise in the drawing. The rates for different items of work shall be for up to 4.0 m floor to floor height at all levels, lifts, leads and depths of the building except where otherwise specified explicitly in the item of work or in special conditions appended with the tender. All works above the top most terrace (main) shall be paid under the level existing below(ie machine room, mumty etc)

- 1.06 The work shall be carried out in accordance with the architectural, structural, plumbing and electrical drawings etc. The drawings shall have to be properly correlated before executing the work. In case of any difference noticed between the drawings, final decision, in writing of the Engineer shall be obtained by the contractor. For items, where so required, samples shall be prepared before starting the particular items of work for prior approval of the Engineer and nothing extra shall be payable on this account.

- 1.07 All materials to be used on works shall bear I.S. certification mark unless specifically permitted otherwise in writing. In case I.S. marked materials are not

available(not produced) , the materials used shall conform to I.S. code or CPWD specifications as applicable in this contract.

In such cases the Engineer shall satisfy himself about the quality of such materials and give his approval in writing. Only articles classified as "First Quality" by the manufacturers shall be used unless otherwise specified. All materials shall be tested as per provisions of the Mandatory Tests in CPWD specifications and the relevant IS specifications. The Engineer may relax the condition regarding testing if the quantity of materials required for the work is small. Proper proof of procurement of materials from authentic manufacturers shall be provided by the contractor to the satisfaction of Engineer. Grade of cement used shall be 43 unless otherwise specified explicitly. The contractor shall get the Design Mix for RCC done by the labs approved by HSCC only. Reinforcement Steel used shall be of FE-415 unless otherwise specified.

- 1.08 In respect of the work of the sub-agencies deployed for doing work of electrification, air-conditioning, external services, other building work, horticulture work, etc. for this project and any other agencies simultaneously executing other works, the contractor shall afford necessary coordination and facilities for the same. The contractor shall leave such necessary holes, openings, etc. for laying / burrying in the work pipes, cables, conduits, clamps, boxes and hooks for fan clamps, etc. as may be required for the electric, sanitary air-conditioning, fire fighting, PA system, telephone system, C.C.T.V. system, etc. and nothing extra over the agreement rates shall be paid for the same.
- 1.09 Unless otherwise specified in the bill of quantities, the rates for all items of work shall be considered as inclusive of pumping out or bailing out water if required for which no extra payment will be made. This will include water encountered from any source such as rains, floods, subsoil water table being high or due to any other cause whatsoever.
- 1.10 Any cement slurry added over base surface (or) for continuation of concreting for bond is added its cost is deemed to have in built in the item unless otherwise/explicitly stated and nothing extra shall be payable or extra cement considered with consumption on this account.
- 1.11 The rate for all items in which the use of cement is involved is inclusive of charges for curing.
- 1.12 The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the site around the building to the satisfaction of the Engineer before the work is considered as complete.
- 1.13 Rates for plastering work (excluding washed grit finish on external wall surfaces) shall include for making grooves, bands etc. wherever required and nothing extra shall be paid for the same.
- 1.14 The rates quoted for all brick/concrete work shall be deemed to include making openings and making good these with the same specifications as shown in drawings and/or as directed. No extra payment shall be made to the contractor on this account.
- 1.15 Rates for all concrete/plaster work shall include for making drip course moulding, grooves etc. wherever required and nothing extra shall be paid for the same.

- 1.16 The drawing(s) attached with the tender documents are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed. The rates quoted by the tenderer shall be deemed to be for the execution of works taking into account the "Design Aspect" of the items and in accordance with the "Construction Drawings" to be supplied to the Contractor during execution of the works.
- 1.17 The quoted rate shall be for finished items and shall be complete in all respects including the cost of all materials, labour, tools & plants, machinery etc., all taxes, duties, levies, octroi, royalty charges, statutory levies etc. applicable from time to time and any other item required but not mentioned here involved in the operations described above. The quoted rate shall also include the cost of providing of vehicle (Ambassador or equivalent) in excellent working condition for official use of site staff of HSCC during project duration including the period of extension granted, if any, limited to 500Km per month, in addition to this the contractor shall also provide suitable office accommodation including storage and furniture including maintenance. The client/HSCC/Employer shall not be supplying any material, labour, plant etc. unless explicitly mentioned so.
- 1.18 The entire works shall be liable to be inspected by Chief Technical Examiner i.e. CTE/ CVC and ISO auditors. The contractor shall provide all necessary help required for in this connection. The contractor shall have to comply with the procedures/ observations/ suggestions of the CTE / ISO in respect of quality, specifications and workmanship in his scope of work, if any. No extra payment shall be made on this account. However any recovery arising out of the CTE's observation shall be borne by the contractor.
- 1.19 All the expenditure incurred towards payment to the local body for getting electrical/ power load, sewer line and water supply connection for Employer shall be reimbursed on production of proof of payment. The contractor shall be promptly extended all assistance in this connection.
- 1.20 Field testing arrangements along with two skilled and two unskilled manpower and equipment are to be made available and maintained at site by the contractor to carry out mandatory field tests as per CPWD specifications. The field tests shall be as listed in CPWD specifications and the equipments to be kept at site are Compressive strength testing machine, set of 6 Nos. of cube moulds of size 150 mm with temping rod, sieve sets for Coarse and Fine sand, cylindrical flask for testing silt content (2 Nos.), weighing balance with weights, equipment for testing initial and final setting time of cement and other apparatus required to fulfill the requirements of mandatory field tests as per CPWD norms.

2.00 ALUMINIUM DOORS AND WINDOWS :

2.1 EXTENT AND INTENT:-

The work shall be carried out through an approved specialist contractor, who shall furnish all materials, labour, accessories, equipment, tools and plant and incidentals required for providing and installing anodized/powder coated aluminium doors, windows, claddings, louvers and other items as called for on the drawings. The drawings and specifications cover the major requirement only. The supplying of additional fastenings, accessory features and other items not mentioned specifically herein, but which are necessary to make a complete installation shall be a part of this contract.

2.2 GENERAL:-

Aluminium doors, windows etc. shall be of sizes, section details as shown on the drawings. The details shown on the drawings indicate generally the sizes of the component parts and general standards. These may be varied slightly to suit the standards adopted by the manufacturer. Before proceeding with any manufacturing, the contractor shall prepare and submit complete manufacturing and installation drawings for approval of the Engineer and no work shall be performed until the approval of these drawings is obtained.

2.3 SHOP DRAWINGS:-

The contractor shall submit the shop drawings of doors, windows, louvers, cladding and other aluminum work, based on architectural drawings, to the Engineer for his approval. The drawings shall show full size sections of doors, windows etc. thickness of metal (i.e. wall thickness), details of construction, sub frame / rough ground profile, anchoring details, hardware as well as connection of windows, doors and other metal work to adjacent work. Samples of all joints and methods of fastening and joining shall be submitted to the Engineer for approval well in advance of commencing the work.

2.4 SAMPLES:-

Samples of doors, windows, louvers etc. shall be fabricated, assembled and submitted to the Engineer for his approval. They shall be of sizes, types etc. as decided by Engineer. All samples shall be provided at the cost of the contractor.

2.5 SECTIONS:-

Minimum doors and windows shall be fabricated from extruded section of profiles of detailed on drawings. The sections shall be extruded by the manufacturers approved by the Engineer. The aluminium extruded sections shall conform IS designation 63400-WP (HV9WP Old designation) with chemical composition and technical properties as per IS: 733 and IS:1285. The permissible dimensional tolerance of the extruded sections shall be such as not to impair the proper and smooth function / operation and appearance of doors and windows.

2.6 FABRICATION:-

Doors, Windows, etc. shall be fabricated to sizes as shown, as shown, at factory and shall be of section, size combinations and details as shown in the Architectural Drawings. All doors, windows etc. shall have mechanical joints. The joints shall be designed to withstand a wind load of 150 kgs. Per sqm. The design shall also ensure that the maximum. All members shall be accurately machined and fitted to form hairline joints prior to assembly. The joint and accessories such as cleats, brackets, etc. shall be of such material as not to cause any bimetallic action, the design of the joints and accessories shall be such that the accessories are fully concealed. The fabrication of doors, windows, etc. shall be done in suitable sections to facilitate easy transportation, handling and installation. Adequate provision shall be made in the door and window members for anchoring to support and fixing of hardware and other fixtures as approved by the Engineer.

- 2.6.1 For fixed portion, the aluminium angle cleat used shall be 38mm x 38mm x 4.8mm size and minimum 50mm long. The quantity of minimum 0.9m length shall be used for 39.13 kg. of extruded sections fabricated.
- 2.6.2 For shutters of doors, windows and ventilators, aluminium angle cleat used shall be of the size mentioned above having minimum length of 35mm. Minimum 0.42 m length of angle cleat shall be used for 20.21 kg. of extruded sections fabricated.

No extra payment shall be made for using such quantity of cleat as mentioned in para 2.6.1 & 2.6.2 above.

2.7 ANODISING:-

All aluminium sections shall be anodised as per IS:7088 and to required colour if specified in the item as per IS:1868 grading as specified in item schedule after cutting the member to requisite sizes before the final assembly. Anodising to conform to specified grade with minimum average thickness of 15 microns when measured as per IS:612. The anodic coating shall be properly sealed by steams or in boiling water are cold sealing process as per IS:1868/IS:6057. Polythene tape protection shall be applied on the anodised section before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and installation. The tape protection shall be removed on installation. The sample will be tested in the approved laboratory and cost of samples, cost of testing, shall be borne by the contractor.

2.7B POWDER COATING:-

Pure polyester powder coating of 50 micron thickness shall be applied of approved shade of Goodlass Nerolac or equivalent make of powder.

2.8 PROTECTION OF FINISH:-

All aluminium members shall be wrapped with approved self adhesive non-staining PVC tapes.

2.9 HANDLING AND STACKING:-

- 2.9.1 Fabricated materials shall be stacked in an approved manner to protect the material against any damage during transportation. The loading and unloading shall be carried out with utmost care, on receipt of materials at site, they shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces / parts. Materials found to be acceptable on inspections shall be repacked in crates and stored safely.
- 2.9.2 In the case of composite windows and doors, the different units are to be assembled first. The assembled composite units should be checked for line, level and plumb before final fixing is done. Units may be serial numbered and identified as how to be assembled in their final location of situation so warrants.
- 2.9.3 Where aluminium comes into contact with masonry brickwork, concrete, planter or dissimilar metals, it shall be coated with approved insulation lacquer, paint or plastic tape to ensure that electro-chemical corrosion is avoided. Insulation material shall be trimmed off to a clean flush line on completion.
- 2.9.4 The contractor shall be responsible for assembling composite, bedding and filling the groove with polysulphide sealant inside and outside, at the transoms and mullions, placing the doors, windows etc. in their respective openings. After the doors / windows have been fixed in their correct assigned position, the open hollow sections abutting masonry concrete shall be fitted with approved polysulphide sealant densely packed and neatly finished.
- 2.9.5 The contractor shall be responsible for doors, windows, etc. being set straight plumb, level and for their satisfactory operation after fixing is complete.

2.10 INSTALLATION:-

- 2.10.1 Just prior to installation the doors, windows, etc. shall be uncrated and stacked on edge on level bearers and supported evenly. The frame shall be fixed into position true to line and level using adequate number of expansion machine bolts, anchor fasteners of approved size and manufacturer and in an approved manner. The holes in concrete / masonry members for housing anchor bolts shall be drilled with an electric drill.
- 2.10.2 The doors, windows assembled as shown on drawings shall be placed in correct final position in this opening and marks made on concrete members at jambs, sills and heads against the holes provided in frames for anchoring. The frame shall then be removed from the opening and laid aside. Neat hole with parallel sides of appropriate size shall then be drilled in the concrete members with an electric drill at the marking to house the expansion bolts. The expansion bolts shall then be inserted in the holes, struck with a light hammer till the nuts is forced into the anchor shell. The frame shall then be placed in final position in the opening and anchored to the support through cadmium plated machine screws of required size threaded to expansion bolts. The frame shall be set in the opening by using wooden wedges at supports and be plumbed in position. The wedges shall invariably be placed at meeting points of glazing bars and frames.

2.11 NEOPRENE GASKETS:-

The contractor shall provide and install Neoprene gaskets of approved size and profile at all locations as shown and as called for to render the doors, windows etc. absolutely air tight and weather tight. The contractors shall produce samples of the gaskets for approval and procure after approval only.

2.12 FITTINGS:-

Hinges, stays, handles, tower bolts, locks and other fittings shall be of approved quality and manufacturers shall be approved by the Engineer.

2.13 MANUFACTURER'S ATTENDANCE:-

The manufacturer immediately prior to the commencement of glazing shall adjust and set all windows and doors and accept responsibility for the satisfactory working of the opening frames.

2.14 MASTIC CEMENT:-

The gaps between frames and supports and also any gaps in the door and windows section shall be raked out as directed and filled with mastic cement of approved colour and make to ensure complete water tightness. The mastic cement shall be of such colour and composition that it would not stain the masonry / concrete work, shall receive paint without bleeding, will not sag and shall not set hard or dry out under any conditions of weather. The samples of mastic cement to be used for this purpose shall be got approved by the Engineer before its actual use.

2.15 DETAILS OF TESTS:-

2.15.1 The various tests on aluminium sections shall be conducted in accordance with the relevant IS codes.

2.15.2 The minimum number of tests for anodic coating and corrosion resistance shall be as given below:-

S.NO. DETAILS	NO. OF TESTS
(i)Doors, Windows & Ventilators	5% of Nos manufactured.

2.15.3 The samples of major member of each unit of doors / windows shall be selected at random by Engineer as such that all the aluminium section shall be got tested.

2.15.4 Work shall be carried out as per CPWD Specifications - 1996 Vol.I to Vol. VI with correction slips 1 to 8 unless specified.

2.16 PROTECTION & CLEANING:-

The sub-contractor shall adequately protect all components and accessories from damage during shipments, storage at job site, erection and after completion of the work. At such

time as may be directed, the sub-contractor shall remove all protective tapes or coating, thoroughly clean all anodized/powder coated aluminium and glass surfaces with suitable cleaning agent, make final adjustments to all ventilators, etc. and hardware leaving all in first class working order.

2.17 SCOPE OF WORK:-

The sub-contractor shall design, supply, fabricate, deliver and install and guarantee all construction necessary to provide a complete aluminium composite panel cladding, complete with all necessary anchors, hardware and fittings to provide a total installation, fully in conformity with the requirements and intent of the drawing and specification herein.

The scope of work shall be read in conjunction with those in the specification of structural glazing.

2.18 ACCEPTANCE CRITERIA:-

The aluminium sections shall conform to the provisions of the relevant item of BOQ. For payment purposes only actual weight of sections shall be taken into account. If, however, the sectional weight of any aluminium section is higher than the permissible variation then the weight payable shall be restricted to the weight of the section including permissible variation.

Measurement : Payment by weight shall be made for aluminium sections including beading only and all fixing angles, fittings / fixtures such as handles and hinges etc. shall not be included in the weight to be paid.

2.19 GUARANTEE BOND : All aluminium work shall carry two years guarantee after completion of the work against water leakage, unsound material and workmanship and defective anodising as per approved proforma.

Two years guarantee in prescribed proforma must be given by the specialised firm, which shall be counter signed by the contractor, in token of his overall responsibility in addition 10% (Ten Percent) of the cost of these items would be retained as guarantee to which the performance of the work done. The cost guarantee against this item of work shall be in addition to the security deposit mentioned elsewhere in the contract form. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days, and if not attended 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 two years is produced and deposited with the department.

2.20 Work shall be carried out as per CPWD Specifications - 1996 Vol.I to Vol. VI with correction slips 1 to 6 unless specified.

2.21 LIGHTENING PROTECTION:-

The structural glazing contractor shall incorporate lightning protection device. The structural glazing contractor shall install all necessary conductors, wiring connection etc.

for the structural glazing. The electrical contractor will be responsible for contracting the earthing system for the lowest and top point of the structural glazing to ground level.

Proposal on the lightning protection system shall be endorsed by a qualified lightning protection engineer. The whole of the system shall be tested to ensure its compliance with the requirements as laid down in the British Standard Code of Practice CP 326:1965 at the cost of the Contractor.

2.22 RATES:-

2.22.1 The rate of the item shall include the cost of materials, T&P, Double Scaffolding and labour, water charges etc. required in all the above operations.

3.00 WATER PROOFING BY INJECTION GROUT METHOD:-

1. Placing and fixing of 12mm dia nozzles of M.S. pipe as per item of Bill of Quantities and protruding at least 25mm from the R.C.C. surface of raft / R.C.C. wall.
2. Injection of cement slurry of different viscosity mixed with waterproofing expansive plasticizing agent (non shrinkage grouting compound) through nozzles under pressure by pump as per manufacturer's specifications using admixture of approved quality & brand conforming to IS-2645.
3. Sealing of the nozzle after injection operation with cement sand mortar in 1:4 (1 cement: 4 fine sand) mixed with suitable admixture.
4. Application of polymer modified cementitious coating (Acrylic polymer latex) as per manufacturer's specifications of chemseal, tapecrete, pidicrete or approved equivalent make conforming to IS-2645 in two coats applied in perpendicular directions, second coat is to be applied at least 4 hours later than first coat over the P.C.C. surface / surface of R.C.C. wall, any undulations in P.C.C. shall be smoothed first by the contractor (without any extra cost)
5. Above cementitious coating is to be protected by a layer of 20mm thick cement plaster in 1:4 (1 cement : 4 coarse sand) mixed with liquid waterproofing admixture as stated in the item.
6. Cementitious coating and protective plaster as above for walls shall be done on both sides of basement wall.
7. Work to be executed in the specified manner using best engineering practices & covered by a 10 years guarantee by the agency.
8. Measurement of wall shall be done for actual treated area on either face of the wall.
9. Rates shall be inclusive of all operations including labour, material, T&P, scaffolding etc. complete. Nothing extra shall be payable on any account.

4.00 LIST OF APPROVED MAKES : CIVIL WORKS

Sl.No.	MATERIALS	MANUFACTURERS
1.	Doors & Windows fixtures/ Fittings:	Everite, Hardima, Earl Bihari
2.	Aluminium Sections.	: Indal , Hindalco, Jindal, Bhoruka
3.	Clear Glass/ Clear Float Glass / Toughened Glass	: Modi, , Saint Gobain(SG),Gujrat Guardian, Tata
4.	Cement	: OPC 43 grade conforming to BIS-8112 and approval of source by the Engineer
5.	Reinforcement Steel	: TMT steel conforming to BIS-1786 and approval of source by the Engineer
6.	Polysulphide sealant.	: Pidilite, Fosroc, Choskey
7.	Admixtures for concrete.	: Cico, Vam Organics, Roffe, Pidilite
8.	Masking Tapes	: Sun control , Wonder Polymer.
9.	Stainless Steel Screws For Fabrication and fixing of Windows.:	Kundan , Puja , Atul.
10.	Proposed Treatment on MS Brackets. :	Galvanised Brackets As per IS:4759-1996 610 gms./sqm.(microns) 80-90
11.	Dash Fasteners.	: Hilti, Fischer, Bosch.
12.	Stainless Steel Bolts, Washers and Nuts.	: Kundan, Puja, Atul.
13.	Stainless Steel Pressure Plate Screws.	: Kundan, Puja, Atul.
14.	Stainless Steel Friction Stay.	: Securistyle, Earl Bihari
15.	E.P.D.M. Gaskets.	: Anand Reddiplex, Enviro Seals
16.	Weather Silicon.	: Wacker, GE, Dow Corning
17.	Structural Silicon at butt joints	: Wacker, GE, Dow Corning
18.	PVC continous fillet for periphery packing of Glazings /Structural glazings.:	Roop, Anand, Forex Plastic.

Sl.No.	MATERIALS	MANUFACTURERS
19.	Aluminium Cleat arrangement for Glazings.	:Deco or approved equivalent
20.	Water proofing / Injection Grouting	: Agency details to be furnished and got approved from HSCC,10 yrs warranty as per specifications.
21.	Structural Steel	:Conforming to BIS 2062 and Approval of source by Engineer
Note	: Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Engineer	

5.00 LIST OF APPROVED MAKES : PLUMBING WORKS

S.No.	Materials	Relevant ISI Code	Manufacturers
1.	Stoneware pipes & Gully Traps	651	IS Marked pipes
2.	R.C.C. pipes	458	IS Marked pipes
3.	C.I. Manhole Covers	1726	RIF, NECO, B.C. , B.I.C.
4.	PVC Rain Water Pipes.		Finolex., Oriplast, Supreme, Prince,
5.	UPVC pipes & fittings	;	Finolex , Prince, Supreme
6.	Gratings, Strainers, Cleanouts etc	:	Details to be submitted and got approved from HSCC.

Note : **Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Engineer**