

SECTION 6.00 FLOORING

Application Code

IS : 1443 - Code of practice for laying and finishing of cement concrete flooring tiles.

IS : 2114 - Code of practice for laying in situ terrazzo floor finish

IS : 777 - Glaze earthenware tiles

6.01 Providing & Fixing precast Mosaic tile flooring

The type, quality, size, thickness, color etc. of the tiles for flooring shall be as per the item description given in the Schedule of Quantities and of best quality. The contractor shall provide the Engineer with necessary sample for approval.

Before the tiling work is commenced, the sub-surface shall be thoroughly cleaned and washed of all loose material, dirt, and surface. The tiles shall be laid on cement mortar or lime mortar bedding of thickness and proportion as specified in the item description. The mortar shall be evenly spread on the sub-floor. Over this mortar bed, 4.4 kg of cement per sqm of floor area shall be spread. The tiles shall be fixed on this bed one after another. Each tile being gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be perfectly straight and uniform in thickness. The tiles shall be laid perfectly in level unless otherwise specified by the Engineer. After laying the tiles the joints shall be finished with white cement or ordinary cement as specified.

For lime mortar bedding lime from burnt stone shall be used. It shall be free from ash and impurities and be in the form of lumps and not powder when brought to site, lime which is damaged due to rain, soaking, moisture or air slaking shall be rejected.

Floor tiles laid adjoining the wall shall project 12mm or as specified under the plaster, skirting or dado as directed by the Engineer. Half tiles and pieces shall be avoided as far as possible. After laying the tiles, it shall be cured for atleast 14 days. About a week after laying the tiles each and every tile shall lightly tapped with a small wooden mallet to find out if it gives a hollow sound, if it does, such tiles along with any other cracked or broken tiles shall be removed and replaced with a new tile to proper line and level. The same procedure shall be followed again after the tiles are finally polished. For the purpose of ensuring that such replaced tiles match with those earlier laid it is necessary that the Contractor order enough extra tiles from the factory to meet this contingency. The tiles shall

finally be cleaned and polished by using dilute oxalic acid or any other method recommended by the manufacturer and approved by the Engineer.

After the joints have attained sufficient strength, the floors shall be machine polished to the desired finish approved by the Engineer. Sufficient quantity of water shall always be used during polishing to prevent scratches.

Mode of Measurement

Unit of measurement for floor tiling shall be sqm or part thereof of the superficial area. Actual quantity of tiling work carried out shall be measured and paid for after making deductions for openings etc. The rate shall include the cost of tiles including wastage, laying as per specifications, curing, polishing etc. all complete.

6.02 Providing & Fixing precast Mosaic tiles in skirting, dado and risers

For dado and skirting work, the vertical surface shall be thoroughly cleaned and wetted. Thereafter it shall be evenly and uniformly covered with about 12mm thick 1:3 cement mortar. For this work the tiles as obtained from the factory shall be of the size required and practically fully polished. The back of each tile to be fixed shall be covered with a thin layer of neat cement paste and the tile shall then be gently tapped against the wall with a wooden mallet. This shall be done from the bottom of the surface upwards. The joints shall be as close as possible and the work shall be truly vertical and flush. The tiles shall be fixed flush with the plaster or projected as specified by the Engineer. The junction of the plaster and the skirting or dado shall be neatly finished. The joints shall be filled with ordinary cement unless otherwise specified. After the tile has set, hand polishing with carborundum stones shall be done so that the surface attains a glossy finish. Corners and junctions be finished true.

Mode of Measurement

Skirting, dado or risers shall be measured in rmt or part thereof. The rate shall include providing tiles including wastage, laying as per specifications, filling joints, curing, rubbing and polishing etc. all complete.

6.03 Providing & Laying cast-in-situ Marble chips flooring

The marble chips shall be of approved size, color and shade. The cement used may be white cement or cement mixed with coloring pigments as directed by the Engineer. The proportion of marble chips to cement shall be as specified in the item description, but in no case it shall be less

than 2:5:1. Samples of terrazzo / mosaic work shall be prepared for approval of Engineer. The entire work shall conform to the approved samples. The terrazzo chips shall be laid after placing the base. The base shall consist of a layer of 28 mm thick 1:2:4 cement concrete (1 cement, 2 coarse sand, 4 19mm and down graded stone aggregate) spread and leveled. While laying the flooring dividing strips of glass/PVC/aluminum of specified thickness shall be inserted in the mortar bed according to the design of the floor. Care being taken to see that no panel exceeds 1.5 sq.m. in area. The top of strips shall be 10mm above the surface of the under bed and shall conform to the finished level of the floor. Chips shall be thoroughly mixed dry and then white cement or cement of approved color shall be added in mixed and evenly spread on the platform and not heaped. Water shall then be added to obtain a plastic mix of suitable consistency as directed by the Engineer. Terrazzo sufficiently but in no case than the day thereafter. The thickness of terrazzo topping shall not be less than 10mm. The surface shall be rammed to obtain the consolidation and a leveled surface. Additional chips shall be sprinkled on the surface and rammed in until surplus cement is checked out and chips forced together so that the finished floor will show not less than 70% aggregate. The surface is finally trowel led lightly. The Contractor shall keep the floor moist for not less than seven days. The surfaces neat grouting of same kind and color as matching. This grouting shall remain at least 72 hours before being removed for final cleaning. The floor shall be refinished wherever necessary to leave the work in first class condition.

Mode of Measurement

This shall be measured in sq.m. The rate shall include providing and laying marble chips flooring with dividing strips, curing, machine /hand polishing. This item shall be also be applicable for flooring in landings, kitchen platform etc.

6.04 Providing and Laying cast-in-situ- marble chips in skirting and dado.

The height of the skirting/dado shall be as per the drawing. The cast layer shall be 12mm cement mortar of 1:3 proportion (1 cement, 3 coarse sand) and top 7 mm thick layer shall be of approved marble chips in proportion 1:2 (1 cement, 2 marble chips). While laying the skirting / dado glass strips of specified width shall be provided. The skirting/dado shall be flush with the plaster or projected as specified by the Engineer. The junction between the skirting/dado and the plaster shall be finished properly. The skirting/dado shall be hand polished.

Mode of Measurement

It shall be measured in sq.m. The rate shall include providing and laying marble chips in skirting/dado, dividing strips, curing, rounding off the corners of the floor and the skirting, hand polishing, cleaning etc.

6.05 Providing & Laying polished green kotah stone flooring

Stone shall be of approved quality, size and uniform thickness, edges shall be chisel dressed and the top surface shall be machine polished with joints running true and parallel from side to side. Stones should be laid on a bed of cement of lime mortar. The pattern of the flooring shall be as per the Architect's drawing. Thickness of mortar bedding shall be as specified in the item specification. The Stone slabs shall be thoroughly wetted with clean water. Neat cement shall be spread over the mortar bed and the slabs shall be placed one by one, Keeping in check the level and line of the flooring. The slabs are then gently tapped with wooden mallet till it is firmly and properly bedded. There should be no voids left. The joints should not be more than 2 mm thick. The joints should be struck smooth. If specification terrazo filling of specified thickness shall be done in the joints between the kota stone slabs. The floor should be kept covered with damp sand or water for a week. Stone should be of sizes as specified. The stone shall be machine polished and then cleaned with oxalic acid. If the contractor is asked to mop the floor with kerosene and water be the engineer, the same be done without any extra cost. The shall be carried out daily atleast for 10 times 7 days.

Mode of Measurement

This shall be measured in sq.m. The rate shall include providing and laying, Curing, machine polishing, cleaning etc. all complete.

6.06 Providing and laying kota stone in skirting & dado

The stone shall be of required sizes and the thickness shall be as mentioned in the item specification. The stones shall be pre-polished and machine cut. The Stone's edges shall be dressed fine true, Straight and at right angles to each other. The Stones shall be fixed over cement mortar bed 1:4 (1 cement : 4 coarse sand). The joints are filled with ordinary cement and its hand and wax polished. The joint between the top of skirting/dado and plaster shall be continued in the skirting/dado also. The work shall be cured properly.

Mode of measurement.

This shall be measured in rmt. If mopping of the Kota stone is asked to be carried out instead of wax polishing the same be carried out without extra cost.

6.07 Providing & laying Pre-polished, machine cut kota stone in treads

Polished green kota stone of specified thickness with machine cut edges shall be fixed for treads of steps in single piece or on the kitchen platform or open shelves trades & risers and window sills as directed. The stones shall be hand and wax polished. The laying procedure is same as specified in the item 6.02 above. Curing shall be done properly.

Mode of measurement.

Measurement shall be in sqm of the stones laid. If mopping of the kota stone is asked to be carried out instead of wax polishing the same shall be done continuously for ten days description in the schedule of Quantities.

6.09 Providing & Fixing kotah stone shelves

The stones shall be pre-polished on both the sides and the thickness shall be 25 to 30mm. The stones shall be placed in the brick masonry zarries and the same shall be finished properly.

Mode of Measurement

This shall be measured in sqm. The rate shall include providing kotah stones, cutting zarries, placing the shelves, filing zarries, propping them till the CM sets and curing all complete.

6.10 Providing & laying rough chiselled kotah stone flooring.

The stones shall be of specified thickness and size. The stones shall be placed on 20 thick CM bedding or lime mortar bedding and the joints shall be with CM 1:2 (1 cement, 2 stone dust). The joints shall be finished flush or with "V" grooves of 5 to 8 mm wide & 8 mm deep. The slope shall be maintained as given in the drawing or as directed.

Mode of Measurement

This shall be measured in sqm. The rate shall include providing and laying of stones, finishing of joints etc. all complete.

6.11 Providing & Laying 40mm thick IPS flooring

The mix shall be 1 part cement, 2 parts coarse sand and 4 parts graded stone aggregate. The flooring shall be laid in panels of uniform sizes nor exceeding 2 sqm. They shall be laid in alternate panels on alternate days. The edges shall be protected properly. Glass/PVC/aluminum strips shall be provided to separate the panels, as per the item description in the schedule of Quantities. The Slope shall be maintained as directed by the engineer.

The mix shall be prepared by volumes. Mixing shall be done in mixers. The concrete shall be placed in position and leveled up with the help of wooden straight edge and trowel and beaten up well till slurry comes on top and holes filled up with concrete.

If IPS had to be laid directly on RCC slab, the surface of the RCC slab shall be roughened up with brushes while the concrete is green. Before laying the floor, the laitance, loose materials, cake of mortar dropping shall be removed and the surface of the slab hacked and coat of cement slurry @2.75 kg of cement per sq.m. shall be applied so as to get a good bond between the slab and IPS. IPS has to be provided on lean concrete no slurry as required.

The flooring shall be finished with 25 mm thick (1:1) cement-sand mortar and cement slurry @2.2 kg.of cement per

sq.m. and water shall be applied on top with wooden floats till the voids in the concrete are filled with mortar cream. The surface must be uniform and even in colour. Dry cement of cement sand mixture shall not be sprinkled to absorb excess moisture in the flooring. The top of flooring chequered with 9 mm thick grove at 75mm x 75mm grove or as directed. Colour pigments shall be added to flooring if instructed by the engineer. Curing shall be done for seven days. The edges of the panels shall be protected from damage.

Mode of Measurement

The flooring shall be measured in sq.m. The finishing plaster is included in the IPS flooring item and shall not be measured separately. The rate shall include providing and laying IPS flooring, finishing the work, curing, rounding of the edges between the wall and skirting, chequering etc complete.

6.12 P & L IPS flooring of 50 mm thick

-DO- same as item 6.11 but for 50mm thick

6.13 P & L IPS flooring of 75 mm thick

-DO- same as item 6.11 but for 75 mm thick

6.14 Extra for providing, mixing and laying of IRONITE.

The ironite shall be consisting of uniformly graded iron particles, free from non-ferrous metal particles, oil, grease, sand and soluble alkaline compounds. This shall be mixed with cement in proportion of 4 cement and 1 compound by eight. The laying procedure is same as per the specification for IPS flooring.

Mode of Measurement

The metallic compound added to the IPS flooring shall be measured in Kg.

6.15 Providing & laying PVC tiles flooring

This shall be laid over IPS flooring. These shall be of approved make. The tiles shall be fixed as per the Manufacturer's specifications.

Mode of Measurement

This shall be measured in sq.m.

6.16 Providing & Laying acid and alkali proof, non-skid ceramic tile Flooring

Ceramic tiles of 20mm thick in sizes and quality as specified in the item description shall be laid for floor on 37mm thick concrete bed of 1:2:4 (1 cement, 2 sand, 4 coarse aggregate of nominal size 12mm and down). The floor shall be first applied with a coat of acid alkali primer and then the bed concrete is laid. The acid alkali proof powder shall be added to the bed concrete in proportions specified by the manufacturer. The tiles shall be laid in proper line, level and slope and with joints of thickness 6-10mm even all around. It shall be cured for 7 days. Then the joints shall be filled with acid alkali proof powder and epoxy resin as specified in the item description. All joints shall be finished neat and it shall be kept dry for atleast for 48 hours.

Mode of Measurement

It shall be measured in sqm. The unit rate shall include the providing and fixing of tiles as specified above. The rate is for work at all levels.

6.17 Providing & Laying Mandana in flooring, skirting and dado.

The sizes of the stones shall be 600 mm x 600 mm or 600 mm x 450 mm or 450 mm or 450 mm x 450 mm x 300 mm or 300 mm x 300 mm as directed, and the thickness shall be 37 mm for flooring and 15-20 mm for skirting and dado. The stone shall be acid and alkali resistance and approved by the Engineer.

The approved quality of acid and alkali preventive primer shall be applied uniformly in two coats over the slab or the concrete surface. The acid-alkali proof powder shall be mixed with the cement in the proportion 2:1 (2 cement:1 powder) or as per the manufacturer's specification. The cement powder mix and sand shall be mixed in the ratio 1:3 and the mortar shall be prepared. The stones shall be laid on the mortar bed in level and line with even thickness of 6mm to 10mm joints all around.

The joints shall be raked to 12-19 mm deep and filled with epoxy based resin. The resin is mixed with quick drier and acid-alkali proof powder. As the resin is an atmospheric hardening agent, it does not require curing. The work shall be kept dry for the joint filling operation. The stones shall be either hand polished or machine polished cleaned with oxalic acid and then wax polished.

Mode of Measurement

The work shall be measured in sq.m part thereof. The rate shall be include providing and laying of stones as described above. Nothing extra shall be paid for cutting holes in the stones, machine cutting of edges, stones for steps and risers etc.

6.18 P & L Ceramic tiles in flooring, skirting and dado
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6.18a The ceramic tiles in flooring and dado shall be if first class quality as specified in the item specification and shall be of standard size without warp and with straight edges true and even in shape and size and uniform colour. The tiles surface shall be if fine grained texture, dense and homogeneous. The thickness of the tile shall be as per the item specification. The tiles shall be submerged in water till the bubbles cease.

The tiles should be laid on a base of 12 mm thick mortar bed (cement or lime 1:3 sand) and cement (3 Kg/sqm) paste. The tiles shall be laid truly vertical on walls and truly horizontal on floors or to slopes as directed. The joint shall be very thin, uniform and perfectly straight. The tiles in dado shall be finished in such a way that, only that tile thickness projects over the finished plaster or as specified otherwise. Where full tiles are not possible, the same should be cut or sawn to the required size and

their edge rubbed to ensure straight and true joints. After tiles are laid extra cement grout shall be removed. The joints shall be cleaned with wire brush and then the joint shall be floated with white or grey cement as approved by the Engineer. The tiles shall be cleaned after the work is complete.

Mode of Measurement

This shall be measured in sqm. The rate quoted for flooring and dado work shall be inclusive of angles and corner pieces, cutting tiles for water points, such away that the point is in the junction of four tiles, electrical points etc.

6.19 Providing & Laying Glazed tiles.

-DO- same as item 6.18.

6.21 Providing Special Mirror Finish Polish on Kota Stone

This shall be carried out by using 500 to 2000 grit emery polishing in six stages and final finishing with 2000 grit tin oxide and felt pads. The work shall be carried out with polishing machine with vibration free rubber lined mounting wheels.

Mode of Measurement

It shall be measured in sqm.

6.22 Providing & laying Granite flooring

The stone shall be of specified quality, hard sound homogeneous in texture, free from cracks, weathering and flaws. All stones shall match each other. All edges shall be true moulded and free from chippings, the surface shall be level, smooth and machine rubbed. The stones shall be laid on a cement mortar bedding of 37 mm thick 1:2 (1 cement sand). No. cement slurry shall be applied after each grinding. The flooring, skirting, dado, tread and platforms shall be pre polished.

Mode of Measurement

It shall be measured in sqm and no deduction upto 0.05 sqm opening. The rate shall include providing, laying, curing and mirror polishing.

6.23 Providing and Laying Shadbad stone in flooring

The specification is same as for item no. 6.05.

Mode of Measurement

Same as per item 6.05

6.24 Providing & Laying Shabad stone in skirting and dado

The specification shall be same as item no. 6.06.

Mode of Measurement

Same as item 6.06.

6.25 Providing & Applying 115mm thick water proofing treatment

First a layer of about 20mm thick in CM 1:3 (1 cement, 2

coarse sand) mixed with waterproofing compound of M/s India Waterproofing Co., Bombay or equivalent shall be laid as instructed by the Engineer. Then brickbats shall be laid over this at the required slopes and levels as per the drawings and the instructions of the Engineer. The surface of the brickbats shall be finished smooth with another layer of water proof plaster and the gaps between the brickbats shall also be filled with CM mixed with water proof plaster. Finally the surface is finished smooth and desired patterns are formed on the surface with thread. All openings, sleeves, drains, pipes etc. shall be specially treated and made sure that they are water tight.

Mode of Measurement

The item shall be measured in sqm. The wall flashing or the vatta shall also be measured in sqm. A guarantee certificate for a period of ten years shall be issued by the Contractor for free maintenance of the treated area.

6.26 Providing & Laying 75mm thick water proofing

-DO- same as item 6.25 but for 75mm thick.

6.27 Providing & Laying Cast Iron Tiles Flooring

Cast iron tiles of specified size shall be supplied to the Contractor and he has to take the delivery from the NDDB stores without any extra cost. The tiles shall be stored safely as any loss or damage shall be at the Contractor's cost. The tiles shall be laid over a bed of 37mm thick 1:2:4, (1 cement : 2 coarse sand : 4 graded stone aggregate of nominal size 12mm and down). The tiles shall be fixed in line and level as per the drawing and as directed by the Engineer. The joints shall be filled with 1:1 cement mortar (1 cement : 1 sand). Curing shall be done at least for 15

days. The tiles shall be hand/machine polished and the entire surface shall be smooth and all joints shall be filled properly.

6.28 Providing & Laying pre-polished Cuddappah stone in treads

The specification is same as for item 6.07.

Mode of Measurement

Same as for item 6.07.

SECTION-7.00 STEEL WORK

Applicable Codes.

IS : 4351 - Steel door frames

IS : 1038 - Steel door, Windows and Ventilators

7.01 Providing & Fixing pressed steel frames for doors.

They shall be made of hollow metal pressed section of approved make such as "Perfect Industrial Products", TIL or of equivalent make. They shall be single/double rebates as per the Architect's drawing. It shall be made of CR sheet and size 65x125x1 mm thick. It shall be provided with four hinges of 125x2 mm thick of friction type. Four hinges shall be provided per leaf of the door. The frame shall be provided with 4 holdfasts of size 150x20x3 mm for each side and the same shall be embedded in brick work with CC 1:2:4 blocks of size 300x230x230 mm. The hollow portion of the frame shall be filled with CC 1:2:4 before it is fixed.

The frame shall be painted with red oxide primer. There shall be provision in the frame for fixing of tower bolts, aldrops, louvers, mortise lock etc. The frame shall be painted with two or more coats of approved synthetic enamel paint to get a uniform finish.

Mode of Measurement

It shall be measured in SQM. The rate shall include providing and fixing of pressed frame as per above specifications.

7.02 Providing & Fixing pressed steel section windows for fully openable windows

The frame shall be of size 100x6x1 mm thick and it shall be of perfect Industrial Products", TIL, Senharvic, Agew or of any approved make. The frames shall be double rebated. The frame shall be provided with 3 holdfasts of 100x15x3 mm long and the same shall be grouted with CC 1:2:4 in the brick work or to RCC member. Shutters shall be made of standard steel sections style F7d, sash bar of T6 and locking bar of F4b section. The hollow portion of the frame shall be filled with CC 1:2:4 before fixing the frame.

Glass of 4mm or 5.5mm shall be fixed with beading as per the Architectural drawing. The beading shall be of

Aluminium of GI hollow square pipe of 10 sq mm and wall thickness 1.25 mm.

The Section shall be provided with arrangement for fixing the MS or aluminum oxidized and washers. The window section shall be painted with one coat of primer and two coats of synthetic enamel paint of approved make and shade.

Mode of Measurement

It shall be measured in sqm. The rate shall be for providing and fixing steel windows as per the above specifications.

7.04 -DO- same as item 7.02 for partly openable and partly fixed windows

-DO- same as item 7.02.

7.05 -DO- same as per item No.7.01 but for louvered ventilators

-DO- same as above but provision shall be given for fixing 4/5.5 mm thick glass.

7.08 Providing and fixing Rolling shutters.

The rolling Shutter shall be of 18 gauge MS solid laths or grill with all the accessories such as top cover (Conform to the size indicated in drawings and shall be of quality specified in the item specification. The rolling slats shall be in one piece and be made of have gauge steel sheet minimum 19 SWG in thickness. A cylindrical hood shall be provided on the top to enclose the shutter when it is open. The rolling shutters shall be provided with suitable locking arrangements and deep channel guides. In case galvanized rolling shutters are specified the rolling shutter shall be made of hot dip galvanized slats hood, deep channel guides all preferable in one piece. The channels guides shall be fixed with holding down bots with PCC 1:2:4 (1 cement, 2 sand, 4 coarse aggregate of nominal size 12mm and down) holing

In case of hand operated pull and push type rolling shutters and very large gear operated rolling shutters of sizes larger than 10 sqm. in area, they shall be provided with ball bearings for smooth and efficient operation. In case of large rolling shutters and depending upon local wind conditions, the rolling shutters should be provided with special locking type of wider channel guides or it shall be provided with central movable channel supports to take up the design wind pressures in the area.

Mode of measurement

i) The measurement shall be in sqm. The width shall be

measured as the width of the shutter including the portion hidden in the guide channels and the height shall be measured from the bottom of the locking plate to the bottom of lintel and to this 450 mm shall be added for the top hood.

- ii) The rate quoted shall be inclusive of providing and fixing or rolling shutter with push and pull arrangement, two coats of approved paint over 2 coats of approved primer coat (one shop coat and one coat after erection). Fixing lugs to be provided to guide channel to suit actual site conditions or as directed by the engineer at no extra cost. The mechanical arrangement provided for the opening and the closing of the shutter shall be paid for separately in sqm of the shutter area as specified in the item description.

7.09 Providing & Fixing Mechanically operated rolling shutters

The specifications same as item no. 7.08

7.10 Providing & Fixing partly grilled Rolling shutters

The specifications same as item no. 7.08

7.11a Providing & fixing in position grill, railing, steel ladder etc.

This work shall be carried out as per the detailed drawing or the Architect. The MS sections shall be of approved quality. The welding shall be perfect and the junctions shall be ground properly. The frames shall be provided with holdfasts and the same shall be grouted with CC blocks of 1:2:4 in brickwork. It shall be painted with one coat of primer and 2 coats of approved synthetic enamel paint.

Mode of Measurement

The dimensions of the members shall be measured in unit lengths and the same shall be converted in to weights as per the standard steel table. The payment shall be done based on the weight of the item.

7.12 Providing & Fixing MS inserts in RCC and Brick work

- a) Inserts, bolts etc shall be provided in masonry and concrete works as indicated on the drawing. It is imperative that all inserts, bolts fixtures and fittings shall be provided in their position very accurately. Such inserts and bolts be fixed with necessary templates. If due to negligence on the part of the contractor, the inserts, bolts fixtures, and fittings etc, are out of alignment the contractor shall make arrangements to have the inserts and bolts removed and refixed in their proper position as directed by the engineer, at no extra cost. The exposed parts shall be painted with

one coat of primer and two coats of approved synthetic enamel paint.

b) Mode of Measurement

It shall be measured in KG. The measurements at site shall be taken in unit lengths and the same shall be converted in to weight using standard steel coefficients, actual weight taken in the presence of the Engineer.

7.13 Providing & Fixing MS gate

It shall be as per the drawing. The welding shall be perfect and the junctions shall be ground properly. The gate shall be provided with locking arrangements, hinges and it shall be painted with one coat of primer and two coats of approved.

Mode of Measurement

All the members of the gate shall be measured in unit lengths and the same shall be converted in to weight using standard steel tables. The payment shall be made in kg.

7.14 Providing & Fixing GI pipe railing

It shall be done with the specified class of GI pipe as per the item in the Schedule of Quantities. The design shall be as per the drawings/instructions. All necessary specials, bends, elbows, tees and holdfasts or clamps shall be provided. If the pipe railing is to be fixed on ground or brick work, it shall be done by embedding the holdfasts, as directed by the Engineer, in concrete blocks PCC 1:2:4 (1 cement, 2 sand, 4 graded coarse aggregate of size 12mm and down). If it is to be fixed to a RCC member, the pipe shall be welded to the steel plate by embedding it in the RCC members.

Mode of Measurement

The running length of the railing shall be measured. The vertical shall not be paid separately.

7.15 Providing & Fixing MS door frame

It shall be fabricated from structural steel as per the details and drawings. All the members shall be free from rust, flakes, cracks and other fabrication defects. All holes for hinges, bolts, locking plated etc. shall be provided as per drawings/ instructed. The welding shall be smooth. The frame shall be erected and fixed with MS holdfasts of specified size and grouted with cement concrete 1:2:4 (1 cement, 2 sand, 4 graded coarse aggregate of nominal size 12mm and down) The frame shall be painted with a coat of primer before erection and 3 coats of

synthetic enamel paint of specified quality after erection.

Mode of Measurement

The length of the members shall be measured and be converted correspondingly to weight in kg using the standard unit weight coefficients. The rate shall include fabrication, erection and painting of the frame.

7.16 Providing & Fixing MS sheet door

The frame shall be of MS as specified above. The door shall be as per the Architect's design. The specified gauge MS sheet door shall be welded to the frame. It should have 3 to 6 hinges depending on the shutter size. It shall have fittings as specified in the item/ Architect's drawings. The door shall be applied with a coat of primer and 2 coats of synthetic enamel paint of quality as specified.

Mode of Measurement

This shall be measured in sqm. If the frames are not included in the item then only the shutter area shall be measured and paid for. The rate shall include fabrication, provision, erection of the door, necessary fittings as specified, painting etc. all complete.

7.17 Providing & Fixing GI barbed wire fencing

This fencing shall either be made with RCC posts and struts or with MS posts and struts. RCC posts and struts shall be of size and length as specified in the item description in the Schedule of Quantities. It shall be free from cracks, twists and honey combing.

MS posts and struts shall be of size and section as specified in the item description. One end of the angle shall be forked to have grip in the concrete and the other side shall have a hole to receive the fencing wire. It shall be applied with a coat of primer and 2 coats of synthetic enamel paint.

It shall be 12 to 14 gauge with 4 points barb two wires twisted together or as specified in the item description. It shall be circular in section, free from scale and other defects and uniformly galvanized. The type, length and standard weight of the GI barbed wire shall be as specified below :-

Nominal dia of wire Line wire	Point wire	Nominal distance between two	Length in M/100kg		
			Nominal	Min.	Max
2.5mm	2.24mm	75mm	1000	934	1066
2.5	2.24	150	1134	1066	1200
2.24	2.24	75	1576	1490	1668
2.24	2.24	150	1890	1778	2000

The GI barbed wire shall be well stretched in number of rows as specified with two diagonals. The spacing shall be at least 15cm from the ground and the rest shall be embedded in PCC 1:2:4 or as specified. It shall be fixed in line, level and plumb. The grouting concrete shall be cured for 7 days. The barbed wire shall be held to posts by means of GI staples, U slips or GI binding wire as specified. Turn buckles and straining bolts shall be used at the ends. Two struts shall be provided at the corners and at every 28M. The length of the strut shall be 1.5 times the length of the post.

Mode of Measurement

It shall be measured in RM. The unit rate shall include providing and fixing of posts, struts, barbed wire, painting of MS posts and struts and curing etc. all complete.

7.28 Providing & Fabrication z-type ventilators

Notes:

1. Steel windows and ventilator shall be fabricated out of steel sections confirming to IS:226, and IS:2202.
2. For fabrication of standard steel section Door, windows, and ventilators following sections shall be used:

Designation	Member	Unit weight kg/Rmt.
F-4B	For window frame	2.217
F-7B	For window shutter	1.532
T-7	For window frame	1.950
EZ-7	For Door frame	1.911

3. Net area of opening shall be measured and paid for relevant item.

SECTION 8.00 ROOFING WORK

- 8.01 Providing, Fabricating & Erecting MS Structural steel work for trusses, purlins, girders, columns, rafters, struts, wind ties , bracings etc.

All structural steel materials such as angles, RS joists, flats, tees, plates, channels etc. shall conform to the latest edition of IS 226. All structural steel shall be free from twist before fabrication. Cutting of members shall be done by shearing, cropping, sawing or gas cutting. Contact surfaces of plates and butt joints shall be accurately machined over the whole area so that the parts connected shall butt over the entire surface of contact. Welding of pieces shall be done with the approval of the Engineer.

The components parts shall be assembled in such a manner that they are not damaged in any way and specific cambers as shown in the drawing or as directed by the Engineer, shall be provided.

For bolted connection, where necessary washers shall be tapered or otherwise suitably shaped to give satisfactory bearing. The threaded portion of the bolt shall project beyond the nut by at least 1.5 thread.

Welding shall be done in accordance with the latest edition of IS 813 and 814, Code of Practice for use of Electric Arc welding for general Construction in mild steel. In welding it must be ensured that the base metal is in fused state when filler metal makes contact with it ; filler metal does not overflow upon any unfused base metal; base metal is not cut along the weld edges; flowing metal floats the slag, oxide and gas bubbles at the surface behind advance pole. For this current shall be adjusted or the electrode size is changed. Welding shall be free from cracks, discontinuity, under or over size welding thickness.

Surface to be welded shall be free from loose mill scale, rut, grease, paint and any other foreign material. As far as possible avoid the welding at heights and at difficult positions. Generally fillet welding is preferred. The parts to be welded are brought in as close contact as practicable and rigidly clamped together.

Before erection, steel work shall be thoroughly cleaned of rust, loose scale, dust, welding slag, and shall be given one coat of red oxide primer of approved make and one coat

of synthetic enamel paint of approved make as specified in the item before erection and final coat of painting after the erection as directed.

Steel members shall be hoisted and put in position carefully

without any damage to the member and to the building and labour. The trusses shall be lifted at such points that they do not buckle or deform or be unduly stressed. The end of the truss which faces the prevailing wind shall be fixed and the other end may be kept free to move. The steel work shall be securely fastened wherever necessary, temporarily braced, to provide for all loads to be carried by the member during erection including the load due to the erection equipment and its operation. No permanent bolting or welding is done until proper alignment has been obtained. The holes for the rivets shall be determined with the help of templates and drilled. Erection clearance of the cleared ends shall not be more than 1.5mm and without cleaning end clearance shall not be more than 3mm. Grouting or embedding of structural steel members done after the approval of the alignment, level & position of the members by the Engineer.

Important points

Before the actual execution of the job, the Contractor shall prepare fabrication drawings for all structural steel work from the structural drawings supplied to him and determine the exact cutting lengths of the members, sizes of gusset plates, welding lengths by marking out on a level platform to full scale.

Welding plant, electrodes and other equipments, scaffolding, labour shall be arranged by the Contractor at his cost. Erection equipment of required capacity, sufficient number of spare parts and staff shall be maintained by the Contractor at site at his cost.

Mode of Measurement

All structural steel members shall be measured in lengths and are converted into weights as per IS tables. All rivets, bolts shall be measured in kg. and paid for. No deduction shall be made for rivet holes and bolts. Nothing extra shall be paid for wastages.

8.03 Providing & Fixing MS Chequered plates

The chequered plates shall be cut to the required shape with arc gas cutting machine. The cut edges shall be ground and finished properly. The plates shall be given a coat of primer and two coats of approved synthetic enamel paint.

The cross section of the plates shall be measured and it shall be converted into weight using standard steel table and paid for.

8.04 Providing & Fixing MS holding down bolts

The MS holding down bolts of specified dia. length and shape shall be provided as per the drawings in line & level. These shall be fixed to RCC work or brick work by grouting it with concrete. The bolt shall be provided with nuts and washers. The grease shall be applied to the threaded portion with the help of templates. If the bolts need some adjustment it shall be provided with a wooden piece 75x75mm or 50mm dia GI pipe around bolt shall be provided at the time of concreting and shall be removed after initial set.

Mode of Measurement

The length of the bolt is measured and according to the dia of the bolt the length shall be converted into weight using standard steel tables.

8.05 Providing & Fixing AC corrugated sheets

AC sheet and accessories shall be free from cracks, chipped edges and corners. The fixing shall be done as per the latest edition of IS 459. The spacing of the purlins shall not be more than 1.4m for 6mm sheets. The light shall not be visible from the joints of the AC sheets. The AC sheets to be kept on ceiling shall be placed with smooth side upward and the AC sheets to be put in cladding shall be placed with smooth side out side. The AC sheets shall have at sides a lap of half corrugation and an end lap of 150mm minimum. The free over hangs at ends shall not be more than 300mm. Hole for 8mm dia L or J bolts shall be drilled and not to be punched in the ridge of the corrugation. The diameter of the hole shall not be more than the diameter of the bolt by 1.5mm. The bolts shall be galvanized J or L hooks with nuts and two nos. of bitumen washers. All AC sheet accessories shall be painted or white washed as specified in the item or directed by the Engineer.

Mode of Measurement

The AC sheet roofing shall be measured in sq.m. It shall include all tools, plants, ladder, scaffolding, triangular

pieces in cladding or at gable ends or at north light, side laps and end laps. The work shall be carried out at all heights without any extra cost.

8.06 Providing & Fixing AC & G.I. accessories

-DO- same as above but for North light curve, AC ridges, Curves, Corner pieces, Barge boards, Eaves board, G.I. gutters etc.

Mode of Measurement

These accessories shall be measured in RM.

8.07 P & F Aluminium Flashing

This shall be fixed between the RCC facial and the AC sheets with bitumen to prevent leakage. The work shall be carried out as per the item specification.

Mode of Measurement

It shall be measured in sqm. unless specified otherwise.

SECTION 9.00 MISCELLANEOUS WORKS

- 9.01 Providing & fixing approved make 6 lever Mortice lock with pair of brass oxidized/ chromium plated handles.

This shall be measured in nos. The rate quoted shall be for providing mortice lock with handles in doors and finishing as per item schedule.

- 9.02 Providing and fixing hydraulic door closer of approved size and make such as EVERITE/ HYPER/ GARNISH or equivalent as directed.

This shall be measured in no. This shall be fixed at places as directed by the Engineer.

- 9.03 Filling the electrical zaris 250mm to 150mm wide and 25mm to 100mm deep with cement mortar 1:3 and finishing the same to match with the surrounding white wash or any other finish, etc. complete as directed.

This shall be measured in RM. No patch shall be seen after the zarris are filled up.

- 9.04 Dismantling brick masonry walls and partitions, plastered or unplastered as per instructions including finishing the broken surface to match with the surrounding, removing the debris as directed within site. cutting the reinforcements if any etc. complete as directed.

The work shall be measured in cum.

- 9.05 Dismantling the RCC beams, slabs, lintels, columns, pardi walls, platform etc. including finishing the broken surface to match with the surrounding, removing the debris within site, including cutting the reinforcement if any etc. complete as directed.

This shall be measured in cum.

- 9.06 Filling the zaris 25mm to 150mm wide and 50 to 100mm deep with CM (1:3:4) and Finishing with plaster to match with surroundings including chiselling, curing etc. complete as directed.

This shall be measured in RM.

- 9.07 Making holes upto 30 cms. in dia. or 30 x 30 cms. in size in RCC works and filling the same with PCC (1:2:4) and finishing the same as per surrounding including scaffolding, cutting the reinforcement bars, curing etc. complete as directed.

This shall be measured in nos.

9.08 -Do- same as item no. 9.07 but in brick masonry wall.

This shall be measured in nos.

9.09 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 150 mm dia.

The specification of the GI pipe shall be as per the specification given in Section 11.00 of the this Technical specifications. It shall be placed during concreting the walls of the sump of underground/over-head water tanks etc.

It shall be measured in nos. The rate quoted shall be for providing and placing of the pipe with flange or threaded in line and level.

9.10 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 100 mm dia.

The specifications same as item no. 9.09.

9.11 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 75 mm dia.

The specifications same as item no. 9.09.

9.12,13

& 14 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 50mm, 38mm and 25 mm dia.

The specifications same as item no. 9.09.

9.15 Providing and fixing removable CI gratings of approved quality for rain water pipes including painting the same with two coats of approved enamel paint as directed for 100 mm dia.

The shall be measured in no.

9.16 Providing and fixing removable CI gratings of approved quality for rain water pipes including painting the same with two coats of approved enamel paint as directed for 150 mm dia.

- Do - same as item No. 9.15

9.22 Providing and fixing vent cowl

The vent cowl shall be of CI or PVC as specified in the item description. It shall be of approved quality.

Mode of Measurement

It shall be measured in nos

SECTION 10.00 ROAD WORK

Materials

Moorum

It shall be got from approved quarries. It shall be granular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The material shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nala or sea. It shall be clear, sound, properly graded ; free from organic material, silt, clay etc. and it shall be well graded.

Metal

The stone metal shall be hard, sound, durable, stone of close texture as is locally available and reasonably free from decay and weathering. It shall be angular or cubical, and round elongated or flaky metals shall be rejected. No round or oblong pebbles or angular chips shall be allowed. The size of the metal shall be 40mm to 63mm. All disintegrated stone shall be rejected. The metals shall be tested for Abrasion value, Aggregate Impact value and Flakiness Index in standard laboratories before the material is put to use and they shall conform to relevant IS codes as given in page 4.16 of this section. Metal shall be stacked at site on fairly level ground.

Rolling

A power roller shall, as a rule, be not less than 10 tones but if at any time still heavier rollers are required on the works the contractor shall have to bring them as may be directed by the Engineer. A hand roller should not be less than a ton. Rolling shall progress from edges to the center of the road in strips parallel to the centre line of the road. Rolling shall be done by lapping uniformly each preceding rear wheel track by at least one half width of the track.

On super elevations, rolling shall be started at inner edge and shall progress towards outer edge. During and after rolling, the surface shall be checked for grade and camber, with camber plate. The roller shall be started, worked or stopped without jerks. Rolling shall not normally be done

length less than 100 M.

10.01 Surface dressing including preparation of sub grade

The high portion of ground shall be cut down and/or hollows and depression shall be filled upto 300 mm. The gradient and camber/slope should be maintained as per requirement so as to give an even, neat and tidy look to the work. The measurement will be in sq.m. The area requiring cutting or filling more than 300 mm shall be paid separately under relevant items of earth work and surface dressing item will not be applicable. Earth from cutting will be used for filling. The rate for the item shall also include jungle clearing viz plants, shrubs, grass etc. excluding trees.

Preparation of Sub grade

The sub grade shall be leveled approximately to the proper level and camber by filling depressions with excavated material and cutting of protuberances. The sub grade shall be made to have as nearly as practicable, a uniform bearing layer and all hard spots therefore be properly excavated and refilled. All soft and spongy parts of the sub grade shall be excavated and refilled with approved materials of 15 cm layers for the same reason. The cost of this excavation will be paid under the item for excavation. The sub grade shall be watered as directed atleast 12 hours before a 10 MT roller is put on it.

Proper accesses should be prepared for the roller to get to the sub grade and all manholes frames and covers should be removed and replaced by plates of adequate strength free of cost whenever they interfere with the free rolling of the sub grade.

After rolling the camber, super elevation and longitudinal slope etc. of the sub grade shall conform in shape to those of the finished road surface. This should be checked with the help of level strings and camber board, if necessary. When sub grade consists of black cotton soil, a thin layer of murrum or coarse sand shall be provided below any base course, watered and rammed and rolled tightly.

Mode of Measurement

The work shall be measured in sq.m. The rate quoted shall include jungle clearing, leveling the surface, dressing to the required shape, grade and camber and rolling .

10.02 Providing & Laying Base course

65 mm, nominal size or as specified, metal shall be spread over the prepared base to a thickness of 130 mm in one or two layers as specified, the metal layer dry and wet shall then be rolled and consolidated by a 10 tonne power roller. The thickness of the consolidated layer after completing all

the operations described below shall be less than 100mm then blinding material like murrum or red Bajri shall be laid and watered and rolled. Rolling shall start from edge of road and proceed towards the crown in longitudinal strips overlapping on successive strips by atleast one half the width of the rear wheel of the roller. The operation shall continue till no visible settlement of the metal or movement under the roller is observed. The gradient and camber shall be checked from time to time by means of level, stacks, strings camber board etc. Any depression or hump shall be corrected by removing completely the metal layer there at the spot and rolling the same satisfactorily.

After the dry rolling is completed, grit, stones, dust, sand etc. shall be spread. Moderate sprinkling of water and rolling shall be continued and stone dust shall again be spread if required till all the voids are completely filled and the movement of metal under the wheel ceases. If there is excess powder the same shall be removed lightly by brooms.

The surface shall be checked for camber etc. the unevenness or undulations shall be rectified as required. The whole surface shall be then watered, extra powder added if required, brushed and rolled to obtain a mosaic surface. This type of surfaces shall be maintained till upper layer is laid.

Mode of Measurement

The metal spreading and compaction shall be measured , under single item, in sq.m., the thickness of the layer shall be as specified in the item specification or in cum as specified in the Schedule of Quantities. The rate shall include all the works described above.

10.03 Providing & Laying wearing course

50 mm metal shall be spread, in one or two layers, over the prepared base to a thickness of 100 mm consolidated and the rate of spreading grit shall not be less than 10 to 15 cft/100 sq.ft. the other operations such as rolling watering etc. as item 10.02.

Mode of Measurement

-Do- same as item 10.02.

10.04 Providing & Laying 37.5mm thick layer of hot asphalt & aggregate over the wearing course

The surface shall then be brushed free of any loose blinding material out of the voids into which it has set. The surface then shall be tested for depression, which shall be made up by remetalling and blinding with aggregate of a size equivalent to the depth of the depression.

Bitumen 80/100 of approved brand, heated to a temperature of 350 Deg.F. shall then be applied evenly to the road surfaced by means of a pressure distributor at the rate of 25 kg per 10 sqm.

While the bitumen 80/100 is still hot the surface shall be laid evenly with premix aggregate of 20mm size well mixed with bitumen. The stone aggregate shall be hot & dry and contain not more than 2% moisture before use. It shall be first screened of dust, measured and heated. The rate of application of stone chips shall be 0.20 Cum Per 10sqm or as specified in the Schedule of Quantities.

After spreading of the premix carpet the road shall be given a final rolling with 10 tonne power roller. Any soft spot or depressions detected at a later date shall be made up as directed by the engineer.

Mode of Measurement

This shall be measured in sqm.

10.05 Providing & Laying Seal coat with hot bitumen

Seal coat is applied to water proof road, to seal the surface, to prevent oxidation due to air circulation to strengthen bitumen surface or to improve texture, reduce porosity and tendency to disintegration.

Seal coat with hot bitumen: Treatment consist of applying a coat of hot bitumen 2.5 kg/sq.m. on prepared surface, blinding with stone grit 0.30 cu.m./10m. and consolidating with road roller of 10 tonne.

Mode of Measurement

It shall be measured in sqm. If the quantity of grit and kg of asphalt per sqm of surface is given in the item specification the same shall be adhered to. The rate shall include covering the surface with sand and removing the sand after 2-3 days as directed by the Engineer.

10.08 Providing & Laying RCC kerb

Road kerbing shall be cast-in-situ/precast cement concrete stone as per the item description in the Schedule of Quantities. In case of pre-cast kerb it shall be laid over Brick bat concrete 1:4:8 150 mm thick or as specified in the ground and the joint between the tow stone shall be filled up with cement mortar (1:6). The stones shall be cast with cement concrete of 1:2:4 proportion within the project premises. The stone shall be c red for atleast 15 days. Contractor shall have to make one tank at his own cost for curing the stones.

Mode of measurement

The whole work shall include excavation , cutting roads if necessary, laying of bed concrete, shuttering, excluding reinforcement, casting, exposed concrete finishing and curing the kerb stones. The item shall be measured in RM.

10.09 Providing & Laying P.C.C. 1:4:8

General specifications are same as item no. 2.02.

10.10 Providing and Laying RCC roads

Mixing and placing of concrete, compacting and curing shall be as per RCC specification. Before concreting the form work should be placed to exact alignment, line and level. The width of panel shall not be more than 6 M. Alternative panels should be cast to avoid cracking and cured. The top surface of the road slab shall be either float finish or striped finish or brush finish or broom finish using neat cement slurry as directed. The entire work shall be cured for minimum 15 days.

Mode of Measurement

The work shall be measured in cum. The rate shall include cost of form work , casting and curing of the slabs. It shall also include the finishing the slab as per the item description.

Reinforcement work shall be measured in respective item of work separately.

10.12 Providing & Fixing CRS TMT bar Reinforcement steel.

General specifications are same as item no. 2.11.

SECTION 11.00 WATER SUPPLY

11.01 a) Providing & Laying under ground GI pipe line for 100mm dia

The pipes shall be galvanized mild steel welded pipes and screwed and socketed tubes conforming to the requirements of IS:1239, for medium grade. They shall be of the diameter (nominal bore) specified in the description of the item. The sockets shall be designated by the respective nominal bores of the pipes for which they are intended. The pipes and sockets shall be cleanly finished well galvanized in and out and free from cracks surface flaws, laminations, and other defects. All screws threads shall be clean and well cut. The ends shall be cut cleanly and square with the axis of the tube.

All screwed tubes and sockets shall have pipe threads conforming to the requirements of IS:554 screwed tubes shall have taper threads while the sockets shall have parallel threads.

The fittings shall be of malleable cast iron or mild steel tubes complying with all the appropriate requirements as specified for pipes. The fittings shall be designated by the respective nominal bores of the pipes for which they are intended. The fittings shall have screw threads at the ends conforming to the requirements of IS:554 Female threads on fittings shall be parallel and male threads (except on running nipples and collars of unions) shall be taper.

The pipes and fittings shall be inspected at site before use to ascertain that they conform to the specification. The defective pipes shall be rejected. Where the pipes have to be cut or rethreaded, the ends shall be carefully filed out so that no obstruction to bore is offered. The end of the pipes shall then be threaded conforming to the requirements of IS:554 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when the two pipes are screwed together. The taps and dies shall be used only for straightening screw threads which have become bent or damaged and shall not be used for turning of the threads so as to make them slack, as the latter procedure may not result in a water tight joint. The screw threads of pipes and fitting shall be protected from damage until they are fitted.

The pipes shall be cleaned of all foreign matter before being laid in jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over with white lead and a few turns of spun yarn wrapped

round the screwed end of the pipes. The end shall then be screwed in the socket, tee etc. with the pipe wrench. Care should be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust and dirt during fixing. Purr from the joint shall be removed after screwing. After laying, the open ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter. Any threads exposed after jointing shall be painted or in the case of under ground piping thickly coated with approved anticorrosive paint to prevent corrosion.

If the galvanized iron pipes and fittings are laid in trenches, the widths and depths of the trenches for different diameters of the pipes shall be as in the table given below:-

Table

Dia of pipe	Width of trench	Depth of trench
15 mm to 50mm	30 cm	60 cm
65 mm to 100mm	45 cm	75 cm

At joints the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications for each work in trenches. The pipes shall be painted with two coats of anticorrosive bitumanistic paint of approved quality. The pipes shall be laid on a layer of 7.5 cm sand and filled up to 15 cm above the pipes. The remaining portion of the trench shall then be filled with excavated earth. The surplus earth shall be disposed off as directed when excavation is done in rock the bottom shall be cut deep enough to permit the pipes to be laid on a cushion of sand 7.5 cm minimum. In case of bigger diameter pipes where the pressure is very high thrust blocks of cement concrete 1:2:4 (2 cement: 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) shall be constructed on all bends to transmit the hydraulic thrust without impairing the ground sand spreading it over a sufficient area.

TEST

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 kg/sq.cm. (60 MWC). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer.

The draw off takes and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped the test pressure should maintain without loss for at least half an hour. The pipes and fittings shall be tested in sections as the work of laying proceeds, keeping the joints exposed for inspection during the testing.

Mode of measurement

- a) The pipes laying shall include all fittings and accessories all proper jointing, painting with anti corrosive paints and testing of pipes shall be paid under this item.
- b) Nothing extra shall be paid for the sand bed of 7.5 cm thick laid below the pipe and 15 cm above for underground pipes.
- c) High thrust blocks of CC 1:2:4, if provided shall be paid under relevant concrete item.

11.02 Providing & Laying under ground GI pipe line for 75mm dia

-DO- same as item 11.01 a).

11.03 Providing & Laying GI pipe 50mm dia under ground

-DO- same as item 11.01 a).

11.04 Providing & Laying GI pipe 38mm dia under ground

-DO- same as item 11.01 a).

11.05 Providing & Laying GI pipe 25mm dia under ground

-DO- same as item 11.01 a).

11.06 Providing & Laying open GI pipe line 100mm dia

For open line work the galvanized iron pipes and fittings shall run along the surface of the walls, ceiling, structure (not in chase) unless otherwise specified. The fixing shall be done by means of standard pattern holder bat clamps, keeping the pipes about 1.5 cm clear of the walls ceiling. pipes may be fixed in the ducts or recesses etc. provided there is sufficient space to work on the pipes with the usual tools.

All pipes and fittings shall be fixed truly vertical and horizontal unless unavoidable the pipes shall be fixed to walls with standard pattern holders bat clamps of required shape and size so as to fit tightly on the pipes when tightened with screwed bolts. The clamps shall be fixed at short length and near the fittings as directed by the Engineer. The pipe line shall be tested as specified in item

11.01.

Mode of Measurement

GI pipes with fittings completely fixed in position shall be measured and paid for the finished center line lengths. The rate shall include providing and laying the pipe line with all necessary specials in open, properly fixing it with clamps and testing the line all complete.

11.07 Providing & Laying open GI pipe line 75mm dia

-DO- same as item 11.06).

11.08 Providing & Laying open GI pipe line 50mm dia

-DO- same as item 11.06).

11.09 Providing & Laying open GI pipe line 38mm dia

-DO- same as item 11.06).

11.10 Providing & Laying open GI pipe line 25mm dia

-DO- same as item 11.06).

11.11 Providing & Laying open GI pipe line 20mm dia

-DO- same as item 11.06).

11.12 Providing & Laying open GI pipe line 12mm dia

-DO- same as item 11.06).

11.13 a) Providing & Laying concealed in structure GI pipe line
38mm dia

For internal work the pipes shall be concealed in the brick masonry. Chasses or zarries shall be cut in the walls and the pipes shall be laid. The pipes shall not ordinarily be buried in solid floors. Where unavoidable pipes may be buried for short distances provided adequate protection is given against damage, but the joints in pipes shall not be buried. Where directed by the Engineer MS sleeve shall be fixed at a place where a pipe is passing through a wall or floor for inception of the pipe and to allow freedom for expansion movements and contraction and other. In case the pipe is embedded in walls or floors it should be painted with anticorrosive bituministic paint of approved quality. The pipe should not come in contact with lime mortar or lime concrete as the pipe shall be laid in layer of sand filling done under concrete floors or as directed by the Engineer.

The floor and wall shall be finished same as the surrounding

surface after the completion of the work. The line shall be tested as specified in the item 11.01.

Mode of Measurement

GI pipes with fittings laid properly shall be measured along the centre line lengths. The rate shall include making carries in the wall, cutting floor, making holes, painting the pipe line with anticorrosive bituministic paint all complete.

11.14 Providing & Laying concealed in structure GI pipe line 25mm dia

-DO- same as item 11.13).

11.15 Providing & Laying concealed in structure GI pipe line 20mm dia

-DO- same as item 11.13).

11.16 Providing & Laying concealed in structure GI pipe line 12mm dia

-DO- same as item 11.13).

11.17 Providing and fixing Sluice valve for 100mm dia pipe line

It shall be of approved quality. It shall be measured in nos.

11.18 Providing and fixing Sluice valve for 75mm dia pipe line

-DO- same as item 11.17).

11.19 Providing and fixing Sluice valve for 50mm dia pipe line

-DO- same as item 11.17).

11.20 Providing and fixing Sluice valve for 38mm dia pipe line

-DO- same as item 11.17).

11.21 Providing and fixing Sluice valve for 25mm dia pipe line

-Do- same as item 11.17).

11.22 Providing and fixing Sluice valve for 12mm dia pipe line

-Do- same as item 11.17).

11.23 Providing and fixing of half turn lever operated valve of

approved quality for 25 mm dia pipe line.

It shall be of approved ISI make. It shall be fixed in the pipe line at the place as directed by the Engineer.

Mode of Measurement

It shall be measured in nos. The rate shall include providing and fixing of the valve as directed.

- 11.24 Providing and fixing of half turn lever operated valve of approved quality for 12 mm dia pipe line.

The specification same as item no. 11.23

- 11.25 Providing & Fixing Bib cock for 15mm dia. pipe line

A bibcock (bib tap) is a draw off tap with horizontal inlet and free outlet. It shall be of specified size and shall be of the screw down type. The closing device should work by means of a disc carrying a renewable non-metallic washer, which shuts against water pressure on a seating at right angles to the axis of the threaded spindle which operates it. The handle shall be either catch or butterfly type securely fixed to the spindle. The cocks shall open in anti-clockwise direction. When the bib cocks are required to be chromium plated the chromium plating shall be of grade B type conforming to IS:1068. In finish and appearance, the plated articles shall be

free from plating defects such as blister, pits, roughness and shall not be stained or discoloured.

Mode of Measurement

It shall be measured in nos.

- 11.26 Providing and fixing long body bib cock.

The specifications same as item no. 11.25 but the bib cock shall have long body which are generally provided for the kitchen sink.

It shall be measured in no.

- 11.27 P&F stop cock for 12mm dia pipe line

A stopcock (stop tap) is a valve with a suitable means of connections for insertion in a pipe line for controlling or stopping the flow. It shall be of specified size and shall be of the screw down type. The closing device should work by means of a disc carrying a renewable non-metallic washer, which shuts against water pressure on a seating at right angles to the axis of the threaded spindle

which operates it. The handle shall be either catch or butterfly type securely fixed to the spindle. Valve shall be of the loose letter seated pattern. The cocks shall open in anti-clockwise direction. When the stop cocks are required to be chromium plated the chromium plating shall be of grade B type conforming to IS:1068. In finish and appearance, the plated articles shall be free from plating defects such as blister, pits, roughness and shall not be stained or discolored.

Mode of Measurement

It shall be measured in nos.

11.28 Providing & fixing Angle valve

The brass fittings shall be of heavy quality, CP and approved manufacture and pattern with screwed or flanged ends as specified. The fittings shall in all respects comply with the requirements of IS:781. The standard size of brass fittings shall be designated by the normal bore of the pipe to which the fittings are attached. A sample of each kind of fittings shall be got approved from the Engineer and all supplied made according to the approved samples. All cast fitting shall be sound and free from lumps pot holes and both internal and external surfaces shall be clean, smooth and free from sand etc. Burring,

plugging stopping or patching of the casting shall not be permitted. The bodies, spindles and other parts shall be

truly machined or that when assembled the points shall be axial, parallel and cylindrical with surface smoothly finished. The area of the water way of the fittings shall not be less than the areas of the nominal bore. The fittings shall be fully examined and cleared of all foreign matter before being fixed. The fittings shall be fitted in the pipe line in a workman like manner. The joints between fittings and pipes shall be made leak proof. the joints and fittings shall be leak proof when tested to a pressure of 6 Kg/sq.cm and the defective fittings and joints shall be replaced or redone.

Mode of Measurement

It shall be measured in nos. The rate shall include providing and fixing of angle valve with the disc. all complete.

11.29 Providing & Fixing CI manhole cover of 40 Kg, 80Kg, 110 Kg.

This shall be of approved make. The cover shall be provided on a CI frame. The frame shall be properly fixed in the brick work/RCC cover slab of the chamber.

Mode of Measurement

This shall be measured in no.

11.30 Providing and Fixing GI water spout of 50 mm dia.

The spout shall be 200 to 450 mm in length as directed by the Engineer. One end of the pipe shall be cut diagonally and tack welded at the bottom to facilitate the flow of water. It shall be fixed at places as directed by the Engineer. The brickwork after the placement of the spout shall be finished properly to match the external finish. The spout shall be painted with paint of approved shade and make.

Mode of Measurement

This shall be measured in no. The rate shall be quoted for providing and fixing water spout in RCC or brick work specified above.

11.31 Providing and Fixing GI water spout of 38 mm dia.

The specification same as item no. 11.30

11.32 Providing & Fixing 100mm dia GI hydrant

The work shall be carried out as per the drawing and as directed. It shall be provided with a wheel valve and a vertical piece of GI pipe to keep the hydrant level above the existing GL at a height as directed by the Engineer. The hydrant shall be fixed in a brick chamber of size 450x450 mm and depth 230 to 500 be finished with PCC 1:4:8 100mm thick and the walls shall be finished with 12mm thick plaster in CM 1:4. An MS cover shall be provided for the chamber.

Mode of Measurement

It shall be measured in nos. The rate shall be for providing the hydrant and connecting it to the main line with required specials, providing and fixing wheel valve and GI pipe piece in a chamber as specified above.

11.36 Providing & Fixing shower rose

This shall be of approved make. This shall be fixed properly as directed by the Engineer.

Mode of Measurement

It shall be measured in nos.

11.38 Providing & Fixing 6mm thick asbestos string for 25mm dia line

This shall be wound closely over the GI pipe concealed in structure.

Mode of Measurement

This shall be measured in RM of the pipe treaded as above.

11.39 Providing & Fixing 6mm thick asbestos string for 12mm dia line

The specifications same as item no. 11.38

11.40 Providing & fixing Towel rail

This shall be brass chromium plated or as specified and of approved make. The length shall be between 500 and 800 mm and the rod shall be of 20mm dia. It shall be fixed as directed by the Engineer.

Mode of Measurement

It shall be measured in nos.

SECTION 12.00 SANITARY WORKS

Scope of work

The scope of work includes providing and fixing sanitary fixtures, providing and laying drainage lines and all items of work described in Schedule of Quantities.

Drawings

Checked and approved drawings showing location of sanitary and water supply fixtures will be furnished to the Contractor and all drawing so furnished shall form a part of this specification. The Contractor shall refer these drawings for all information contained thereon which pertains to and required for this work.

In the case of variations between the drawings and the specifications, or discrepancies in the information furnished by the Engineer, the Contractor shall refer such discrepancies to the Engineer before proceeding with such work.

All connected works will be measured and paid under respective items of work unless specifically mentioned otherwise.

12.01 Providing & Laying stoneware pipe of 300mm dia

All pipes with spigot and socket ends shall conform to IS 651 and shall be of grade 'A' as specified. These shall be sound free from visible defects such as fire cracks or hair cracks. The glaze of the pipe shall be free from crazing. The pipes shall give a sharp clear sound when struck with a light hammer. There shall be no broken blisters. The approximate thickness of 60 cm long pipes shall be as given in the table.

Internal diameter of the pipe mm	Thickness the barrel and socket mm	Weight of each pipe per M kg
100	12	14
150	16	22
200	17	33
230	19	44
250	20	52
300	25	79
350	30	100
400	35	128
450	38	147

The length of pipes shall be 60 cm exclusive of the internal depth of the socket. The pipe shall be handled with sufficient care to avoid damage to them.

All pipes shall be laid on a bed of 15 cm cement or lime concrete as specified, projecting on each side of the pipe to the width of the trench which shall be nominal dia of pipe + 400 mm. The pipes with their crown level at 1.20 m depth and less from ground shall be covered with 15 cm thick concrete above the crown of the pipe and sloped off to meet the outer edges of the concrete, to give a minimum thickness of 15 cm around the pipe. Pipes laid at a depth greater than 1.20 m at crown shall be concreted at the side upto the level of the center of the pipe and sloped off from the edges to meet the pipe tangentially. The concreting shall be done as per specifications for concrete. The pipes shall be carefully laid to the alignment levels and gradients shown on the plans and sections great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. The pipe shall be laid with socket up the gradient. The body of the pipe shall for its entire length rest on an even bed of concrete and places shall be formed in the concrete to receive the socket of the pipe.

Where pipes are not bedded on concrete the trench floor shall be left slightly high and carefully bottomed up as pipe laying proceeds, so that the pipe barrels rest on firm and undisturbed ground. If the excavation has been carried to low the desired levels shall be made up with concrete 1:5 10 (1 cement: 5 coarse sand : 10 graded brick bat of 40 mm nominal size for which no extra payment shall be made.

If the floor of the trench consists of rock or very hard ground that cannot easily be excavated to a smooth surface the pipe shall be laid on a levelling course of concrete as desired. When SW pipes are used for storm water drainage, no concreting will normally be necessary. The cement mortar for jointing will be 1:3 (2 cement: 3 fine sand) testing of joints will also not be done.

Tarred gasket of hemp yarn soaked in thick cement slurry shall first be placed round the spigot of each pipe and the spigot shall then be slipped home well into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and the gasket caulked tightly home so as to fill not more than 1/4th of the total depth of the socket.

The remainder of the socket shall be filled with stiff mixture of cement mortar in the proportion of 1:1 cement 1 fine sand when the socket is filled, a fillet shall be

formed round the joint with a trowel forming any angle of 45 with the barrel of the pipe. After a day's work any extraneous material shall be removed from the inside of the pipe. The newly made joints shall be cured.

Water test

- a) Stoneware pipes used for sewers shall be subjected to a test pressure of 1.5 m head of water at the highest point of the section under test. The test shall be carried out by suitably plugging the low end of the drain and the ends of the connection if any and filling the system with water. A buckle bend shall be temporarily jointed in at the top end and a sufficient length of vertical pipe jointed to it so as to provide the required test head. Or the top may be plugged with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitably for observation. Where leakage will be visible the defective part of the work shall be removed and made good.

In cases where pipes are not bedded on concrete special care shall be taken in refilling trenches to prevent the displacement and subsequent settlement at the surface resulting in uneven street surfaces and dangers to foundations etc. The backfilling materials shall be packed by hand under and around the pipe, and rammed with a shovel and light tamper. The method of filling will be continued upto the top of pipe. The refilling shall rise evenly on both sides of the pipe continued upto 60 cm above the top of pipe so as not to disturb the pipe. No tamping should be done within 15 cm of the top of pipe. The remainder of the backfill shall not be done until 7 days have elapsed for brick sewers and 14 days for concrete sewers, unless local conditions or materials are suitable for the earlier placing of load on the pipes. The tamping shall become progressively heavier as the depth of the backfill increases.

In measuring the length of sewer pipes, laid length between faces of manholes shall only be measured

omitting lengths of channels between inside faces of walls of manholes or chambers.

Mode of measurement

- a) Providing and laying of pipes, The cement concrete bed provided for the pipes jointing as per above specifications and testing of pipes which carry waste water and sewage all shall be paid in RM under this item.
- b) The concrete provided for hunching shall be paid under the respective concrete item.

12.02 Providing & Laying Stoneware pipe of 230mm dia

-DO- same as item 12.01).

12.03 Providing & Laying Stoneware pipe of 150mm dia

-DO- same as item 12.01).

12.04 Providing & Laying stoneware pipe of 100mm dia

-Do- same as item 12.01).

12.07 Providing & Fixing Stainless Steel Sink with drain board.

It shall be of approved make. It shall be provided with fittings and specials like CI brackets, overflow, rubber plugs, CP brass chain, 31 mm dia CP brass waste pipe. The brackets shall be painted with two coats of synthetic enamel paint.

12.08 Providing & Constructing SW 100mm dia gully trap

SW gully trap for 100/150mm dia pipe shall be fixed in a chamber of 230 thick wall of size 300x300 mm , 12mm thick plaster in CM 1:4 inside , 100mm thick PCC 1:4:8 bed shall be laid over that 38mm thick IPS flooring shall be provided and finished properly. The chamber shall be provided with a CI frame and cover.

Mode of Measurement

It shall be measured in nos. The unit rate shall include all works necessary for the item as specified above.

12.09 Providing & Fixing 100 mm HCI nahni trap

The trap shall be painted with anticorrosive paint and fixed

in position with PCC 1:2:4(1 cement, 2 sand, 4 graded coarse aggregate of nominal size 20mm and down) The brass CP jali shall be placed over the trap . The flooring around the trap shall be properly finished.

Mode of Measurement

This shall be measured in nos.

12.10 Providing & Fixing 150 mm HCI Nahni trap

- Do - as same item no. 12.09

12.11 Providing & Constructing Man holes.

Manholes of different types and sizes as specified shall be constructed in the sewer line at such places and to such levels and dimensions as shown in the drawings or as directed by the Engineer. The size indicate the inside dimensions of the manhole.

Excavation and back filling shall be as per respective specifications.

Manhole shall be built on a bed of brickbat cement concrete 1:4:8 (1 cement : 4 sand : 8 brickbats of 40 mm nominal size). The thickness of the bed concrete shall be 150 mm unless otherwise specified.

Brick work shall be in cement mortar 1:6 (1 cement : 6 sand). The external joints of the brick masonry shall be finished smooth. The joints of the pipes with the masonry shall be made perfectly leak-proof with cement concrete 1:2:4.

The brick walls of the manholes shall be plastered inside with 12mm thick cement plaster 1:4 (1 cement : 4 sand finished smooth with a floating coat of neat cement.

Channels and benching shall be in cement concrete 1:2:4 (1 cement : 2 sand : 4 graded stone aggregate)

The depth of channels and benching shall be as indicated in the table given below:

Size of drain mm	Top of channel at the centre above bed concrete cm	Depth of benching at side walls above bed concrete cm
100	15	20
150	20	30
200	25	35
250	30	40
300	35	45
350	40	50
400	45	55
450	50	60

All manholes dipper than 1.0 m shall be provided with CI foot rest. These shall be embedded 20 cm deep with 20x20x10 cm blocks of cement concrete 1:2:4 (1 cement : 2 sand : 4 graded stone aggregate). The block with CI foot rest placed in its centre shall be cast-in-situ along with the masonry and the surface finished with 12 mm thick cement plaster 1:4 (1 cement: 4 sand) finished smooth. Foot rests shall be fixed 30 cm apart vertically and staggered

laterally and shall project 10 cm beyond the surface of the wall. The top foot rest shall be 45 cm below the manhole cover. Foot rests shall be painted with coal tar, the portion embedded in cement concrete block painted with thick cement slurry before fixing.

CI manhole covers and frames shall conform to IS:1726. The covers and frames shall be cleanly cast and they shall be free from air and sand holes and from cold struts. They shall be neatly dressed and carefully trimmed. All casting shall be free from voids whether due to shrinkage, gas inclusion or other causes. Cover shall have a raised chequered design on the top surfaces to provide an adequate non slip grip. The cover shall be capable of easy opening and closing it shall be fitted in the frame in workmanship like manner. The cover shall be gas tight and water tight. Covers and frames shall be coated with a black bitumenous paint. It shall not flow when exposed to a temperature of 63 Deg. Cent. and shall not be brittle as to chip off at temperature of 0 Deg. Cent.

Manhole cover and frame shall conform to medium duty 500 mm internal diameter and shall weight not less than 75kg unless other wise mentioned in the item description.
(weight of cover 58 kg and weight of frame 58 kg).

Manholes shall be measured in numbers. The depth of the manhole shall be reckoned from top level of CI cover to the invert levels of channel. The depth shall be measured correct to centimeters.

Sewers of unequal sectional area shall not be jointed at the same invert level in a manhole. The invert of the smaller sewer at its junction with main shall be, at a height at least 2/3 the diameter of the main, above the invert of the main. The branch sewer should deliver sewage in the manhole in the direction of main flow and the junction must be made with care so that flow in the main is not impeded. No drains from house fittings e.g. GT, soil pipe etc. exceeding a length of 6m shall be connected unless it is inevitable.

The frame of the manhole cover shall be firmly embedded to correct alignment and levels in plain cement concrete 100 mm thick 1:2:4 (1 cement : sand : 4 graded stone aggregate) on top of the brick masonry. After completion of the work manhole covers shall be smeared by means of thick grease.

Mode of Measurement

It shall be measured in no.

12.11 providing & Constructing inspection chambers size 600mm x 600mm x 1.0metre.

12.12 Providing & Constructing inspection chambers size 1000mm x 1000mm x 1.0/1.5metre.

-DO- same as item no 12.11

12.13 Providing & Constructing inspection chambers size 1200mm x 1200mm x1.5/2.0metre.

-DO- same as item no 12.11

12.14 Providing & Laying Open PVC rain water line 150mm dia

The strength of the pipe shall be 4kg/sqcm. It shall be of approved make. It shall be provided with all necessary specials. It shall be jointed with adhesive as per the manufacturer's specifications.

Mode of Measurement

It shall be measured in RM. The rate shall include providing the specified quality of pipe with necessary specials , cutting the walls and making them good after the laying , jointing with adhesives all complete.

12.15 Providing & Laying Open PVC rain water line 100mm dia

-DO- same as item 12.14.

12.16 Providing & Construction Soak Pit.

The earth excavation shall be carried out to the exact dimensions as shown in the drawing. The soak pit shall be constructed of honey-comb dry brick work of 250mm thick in cement mortar 1:6, filled with brick bat upto height as specified RCC 1:2:4 precast or cast-in-citu slabs 150 mm thick for top cover with reinforcement. CI manhole cover 500 mm dia of 80 Kg. weight, 150 mm dia sw tee, outlet vent, 75 mm dia CI pipe, 2 m high fixed on masonry pedestal with cowl and bituminastic painting, refilling, watering, consolidating etc., all complete.

Mode of Measurement

All above mentioned works shall be measured under the respective Traders & items as given in the Schedule of Quantities.

12.17 Providing and Constructing Septic tank

Septic tanks shall be built as per the drawings. The cost of all works such as excavation backfilling, concrete, reinforcement etc., shall be paid under the respective items included in the specification.

Mode of Measurement

The various works involved shall be measured and paid for in the respective trade as given in the Schedule of Quantities.

12.28 Providing & Fixing Indian type WC/Oriassa pan

This shall be the long pan pattern with footrests/Oriassa pattern, as specified, made of white glazed vitreous china or of white glazed fire clay. Each pan shall have an integral flushing rim of suitable type. It shall also have an inlet or supply horn for connecting the flush pipe. The flushing rim and inlet shall be of the self draining type. It shall have a weep hole at the flushing inlet to the pan. The flushing inlet shall be in the front unless otherwise specified or ordered by the Engineer. The inside of the bottom of pan shall have sufficient slope from the front towards the outlet and the surface shall be uniform and smooth to enable easy and

quick disposal while flushing. The exterior surface of the outlet below the flange shall be an unglazed surface which shall have grooves right angles to the axis of the outlet. Pans shall be provided with a trap 'P' or 'S' type with vent horn etc. complete.

Mode of Measurement

It shall be measured in nos. The rate shall include the providing and fixing of the footrests also.

12.29 Providing & Fixing large flat back urinal

Urinals basins shall be a flat back or corner wall type lipped in front as specified in the item description in the Schedule of Quantities. They shall be of white glazed earthenware, white glazed vitreous china or white glazed fire clay, and of size as specified. The urinals shall be of one piece construction. Each urinal shall be provided with not less than two fixing holes of a minimum dia of 6.5 mm on each side. Each urinal shall have an integral flushing rim of suitable type and inlet or supply horn for connecting the flush pipe. The flushing rim and inlet shall be of the self draining type. It shall have a weep hole at the flushing inlet of the urinal. At the bottom of the urinal, an outlet for connecting to an outlet pipe shall be provided. The exterior of the outlet

horn shall not be glazed and the surface be provided with grooves at right angles to the axis of the outlet to facilitate fixing to the outlet pipe. The inside surface of the urinal shall be uniform and smooth throughout to ensure efficient flushing. The bottom of pan shall have sufficient slope from the front, towards the outlet such that there is efficient draining of the urinal. The waste fittings shall be chromium plated. Also CP brass spreader and pipe of a00mm dia shall be provided.

Mode of Measurement

It shall be measured in nos. The rate shall include CI brackets & screws, CP brass spreader pipe etc. all complete. The bottle trap if asked to be provided, it shall be measured in nos and paid for separately.

12.30 Providing & Fixing Wash basin

[i]

Wash basins shall be of white glazed earthenware, white glazed vitreous china or white glazed fire clay as specified. These shall be of the following type and

sizes indicated against each type:

Types	Size
Flat back	630x450 mm
Flat back	550x400 mm
Flat back counter top with antis splash rim	530x430 mm

- b) Wash basins shall be of one piece construction, including a combined overflow. All internal angles shall be designed so as to facilitate cleaning. Each basin shall have a rim on all sides except sides in contact with the walls and shall have skirting at the back.. Basins shall be provided with single or double tap holes as specified. The tap holes shall be square. A suitable tap hole button shall be supplied if one tap hole is not required in installation. Each basin shall have a circular waste hole to which the interior of basin shall drain. The waste hole shall be either rebated or be beveled internally with diameter of 63mm at top and a depth of 10 mm to suit a waste plug having 64 mm diameter. Each basin shall be provided with a non-ferrous 32 mm washer fitting. Stud bolts to receive the brackets on the underside of the wash basins shall be suitable for a bracket with stud not exceeding 13mm diameter 5 mm high and 305 mm from the back of basin to the centre of the stud. The stud slots shall be of depth sufficient to take 5mm stud every basin shall have an integral soap holder recess or recesses which shall fully drain into the bowl. The position of the

chain stay hole shall not be lower than the over flow slot. A slot type overflow having an area of not less than 5 sq cm shall be provided and shall be so designed as to facilitate cleaning of the overflow. The specifications for waste plug, chain and stay shall be the same as given for sinks.

- c) All the waste fittings shall be chromium plates bottle trap conform to IS:5434 the chromium plating shall be of grade B type conforming to IS:1068. Also CI brackets shall be provided with screws.

Mode of Measurement

It shall be measured in nos. The rate shall be quoted for providing and fixing wash basin as specified above.

12.31 Providing & Fixing oval type Wash basin

[ii]

The specifications are same as item no. 12.30 [i].

Mode of Measurement

It shall be measured in nos.

12.35 Providing & Fixing Flush valve

It shall be approved make.

Mode of Measurement

It shall be measured in nos.

12.37 Providing & fixing bottle trap

It shall be of heavy duty approved quality and make. It shall be provided with necessary connecting pipe, wall flange etc.

Mode of Measurement

This shall be measured in nos.

12.38 Providing & Fixing paper holder.

It shall be of approved quality. It shall be glazed white vitreous china recessed type. It shall have a wooden roller or aluminium or as specified and a roll of paper.

Mode of Measurement

This shall be measured in nos.

12.43 Providing & Fixing Soap Dish.

It shall be of approved quality. It shall be measured in nos.

12.44 Providing & fixing 450x600 mm size mirror.

This shall be fixed in approved quality plywood including screw, two coats of red oxide etc. shall be measured in nos.

12.45 a) Providing & Laying 300mm dia non-pressure hume pipe

The pipe shall be with or without reinforcement as required and of the class as specified. These shall conform to IS:458. The reinforced cement concrete pipes shall be manufactured by centrifugal (or spun) process while unreinforced cement concrete pipes by spun or pressure process. All pipes shall be true to shape, straight,

reflect sound and free from cracks and flaws, the external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate pressure pipes) shall withstand a test pressure equivalent to 0.7 kg/sq.cm (7 m head) of water.

Concrete used for the manufacture of unreinforced and reinforced concrete pipes and collars shall not be leaner than 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone aggregate). The max. size of aggregate should not exceed one third of the thickness of the pipe or 20 mm whichever is smaller. The reinforcement in the reinforced concrete pipes shall extend throughout the length of the pipe. The circumferential and longitudinal reinforcements shall be adequate to withstand the specified hydrostatic pressure and further bending stresses due to the weight of water when running full across a span equal to the length of pipe plus three times its own weight. The minimum cover for reinforcement of spun pipes and for all other pipes shall be as given below:

Pipes thickness	Spun pipes	Pipes other than spun pipe
	mm	mm
Less than 30 mm	9	12
30 mm to 75 mm	12	18
75 mm and over	18	18

Where the pipe shall be bedded directly on soil, the bed shall be suitably rounded to fit the lower part of the pipe the cost for this operation being included in the rate for laying the pipe.

Loading, transporting, and unloading of concrete pipes shall be done with care. Handling shall be as to avoid impact. Gradual unloading by inclined plane or by chain

block is recommended. All pipe sections and connections shall be inspected carefully before being laid. Broken or defective pipes or connections shall not be used. Pipes shall be lowered into the trenches carefully mechanical appliances may be used pipes shall be laid true to the line and grade as specified laying of pipe shall proceed upgrade of a slope.

If the pipe have spigot and socket joints, the socket ends shall face up-stream. In the case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid. Adequate and proper expansion joints shall be provided where directed.

In case where the foundation conditions are unusual such as in the proximity of trees or holes under existing or proposed tracks, manholes etc. the pipe shall be encased all-round in 15 cm thick cement concrete 1:5:10 (1 cement : 5 coarse sand 10 graded stone aggregate 40 mm nominal size) or compacted sand or gravel.

In cases where the natural foundation is inadequate the pipes shall be laid either in concrete or cradle supported on proper foundations or on any other suitably designed structure. If a concrete cradle bedding is used the depth of concrete below the bottom of the pipe shall be at least 1/4th of the internal dia of the pipe subject to a minimum of 10 cm and a max. of 30 cm. The concrete shall extend up the sides of the pipes at least to a distance of 1/4th of the outside diameter for pipes 300 cm and over in diameter. The pipe shall be laid in this concrete bedding before the concrete has set pipes laid in trenches in earth shall be bedded evenly and firmly and as far up the haunches of the pipes as to safely transit the load expected from, the backfill through the pipe to the bed. This shall be done either by excavating the bottom of the trench to fit the curve of the pipe or by compacting the earth under the curve of the pipe to form an even bed. Necessary provision shall be made for joint wherever required. When the pipe is laid in a trench in rock, hard clay, shale or other hard material the space below the pipe shall be excavated and replaced with an equalizing bed of concrete sand or compacted earth. In no case shall pipe be laid directly on such hard material. When the pipes are laid completely above the ground the foundations shall be made even and sufficiently compacted to support the pipe line without any material settlement. Alternatively the pipe line shall be supported on rigid foundations at intervals. Suitably arrangements shall be made to retain the pipe line in the proper alignment such as by shaping the top of the supports to fit the lower part of the pipe. The distance between the supports shall

in no case exceed the length of the pipe. The pole shall be supported as far as possible close to the joints. In no case shall the joint come in the

centre of the span. Care shall be taken to see that superimposed loads greater than the total load equivalent to the weight of the pipe when running full shall not be permitted. Suitably designed anchor blocks at change of directions and grades for pressure lines shall be provided where required.

Jointing of the pipes shall be done as described below:

- a) Collar shall be spaced symmetrically over the two pipes and the space between collar and pipe filled with cement mortar 1:1 thoroughly rammed with caulking tools. The joint shall be finished with a fillet sloping at 45. Joints shall be protected and cured for about 10 days. If specified in the item specification wedge shaped groove in the end of the pipe shall be filled with a special bituminous plastic compound for bitumen soaked spun yarn. The collar shall then be slipped over the end of pipe and next pipe butters well against tee plastic compound by suitably appliance so as to compress the plastic compound in the grooves, care being taken not to disturb concentricity and level of the pipes.

Mode of measurement

- a) Providing and laying of pipe links, rounding off the bed to fit the lower part of the pipe, jointing of pipes all shall be paid in RM under this item.
 - b) The concrete bed and blocks of CC 1:2:4 provided at junction shall be paid under concrete work.
- b) Providing & Laying 230 mm dia non-pressure hume pipe
- DO- same as item 12.45 a).
- c) Providing & Laying 150 mm dia non-pressure hume pipe
- DO- same as item 12.45 a).

SECTION 13.00 ALLUMINIUM WORKS

Detailed specifications shall be as per Schedule of Quantities.

SECTION V

FORM OF BID

The Appendix forms part of the bid. Bidders are required to fill up all the blank spaces in this Form of Bid and Appendix.

Name of Contract :

Name and address : Shree Somnath Trust, Prabhas- Patan
Somnath Dist. Junagadh Pin:362268

Description of Works : CIVIL, STRUCTURAL AND INTRNAL ELECTRIFICATION WORK
FOR 8 NOS STAFF QUARTERS AT SOMNATH & 6 NOS STAFF
QUARTERS AT BHIDIYA PRABHAS PATAN & UNDER
GROUND WATER TANKS FOR BOTH SITE AT PRABHAS
PATAN SOMNATH TA. VERAVAL DIST. GIR, SOMNATH

Dear Sirs,

1.0 Having examined the Drawings, Conditions of Contract, Specifications and Schedule of Quantities for the execution of above mentioned works, we, the undersigned offer to execute, complete and maintain the whole of the said works in conformity with the said Drawings, Conditions of Contract, Specifications and Schedule of quantities for the sum of * Rs. _____
or such other sum as may be ascertained in accordance with the said conditions.

* The total Bid Price is to be inserted in words and figures by the Bidder. The currency of the Bid shall be in accordance with clause 12.0 of Instructions to Bidders.

2.0 We undertake, if our bid is accepted to commence the Works within ** _____ days of receipt of the Letter of Acceptance, and to complete and deliver the whole of the above said works comprised in the Contract within ** _____ days calculated from the last day of the afore said period in which the Works are to be commenced.

- 3.0 If our bid is accepted we will furnish a security in the form of a bank guarantee (to be approved by you) to be jointly and severally bound with us in amount of 5% of the above named sum in accordance with the Conditions of Contract .
- 4.0 We agree to abide by this bid for the period of 90 days from the date of bid opening prescribed in clause 13 of the Instruction to Bidders, and it shall remain binding upon us and may be accepted at any time before the expiry of that period.
- 5.0 Unless and until an Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding Contract between us.
- 6.0 We understand that you are not bound to accept the lowest or any Bid you may receive.
- ** To be inserted by the Bidder. The numbers should conform to the timing specified by the SHREE SOMNATH TRUST in the Bidding documents.

APPENDIX TO THE FORM OF BID

Section

	No.	Clause No.	
Amount of Performance Security	I	33	2% of the contract value
Bank Draft	I	14	Rs.2,00,000/- As EMD
Minimum Amount of Third Party Insurance	II	23	Rs.3.50 Lakh per occurrence
Period for Commencement, from the Date of Letter of Acceptance	41	**	One week (7 days)
Time for Completion	43	**	12(Twelve) Months
Rate of Liquidated Damages	47		1,00,000.00(Rupees One Lac)per week
Maximum Limit of Liquidated Damages	47		10% of Contract value
Rate of Bonus	48		NOT APPLICABLE
Maximum Limit of Bonus	48		NOT APPLICABLE
Period of Maintenance (Defect liability Period)	50		12 months ----
Percentage of Retention	60		5.0% of total actual value of work done.
Maximum Limit of Retention Money	60		5% of Contract value
Time with in which the payment would be made after the Certificate	60		15 days ----
Material advance	60		NOT APPLICABLE
Dated this ____ day of ____ 2017__.			

Signature_____ in the capacity of _____
duly authorized to sign the bid for and on behalf of _____

(in capital letters).

** To be inserted by the Bidder. The numbers should conform to the timing specified by the SHREE SOMNATH TRUST in the Bidding documents.

Name of Witness
Address

Signature

SHREE SOMNATH TRUST

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CONTRACTOR

SECTION - VI
SCHEDULE OF MATERIAL TO BE ISSUED BY THE OWNER

MATERIAL ADVANCE : NO ADVANCE SHALL BE PAID AGAINST ANY OF THE MATERIAL BROUGHT AT SITE AND UNCONSUMED WHATSOEVER.

Material advance shall not be paid in any case by the Somnath Trust. However, owner intend to supply certain materials.

In case, of supply of the following materials at site by the Owner, the cost of such material supplied to the contractor at site by The Shree Somnath Trust/Owner will be deducted from the R.A. bills and final bill of the contractor as per the following basic rate of each item shown here under supplied by Owner. Schedule showing materials to be supplied by the OWNER.

Particulars	Unit	Rate at which material will be supplied to the Contractor	Place of delivery
Cement	Bag		
OPC 53 Grade	of 50 kgs.	Rs. 250/-	at site
TMT Reinforcement			
Steel(CRS bars)	M.T.	Rs.45,000/-	,,
Ceramic tiles Floor	Sqmt	Rs. 550/-	,,
Dado	Sqmt	Rs. 550/-	,,
Vitrified Tiles & skirting	Sqmt	Rs. 750/-	,,
Black Jed Granite	Sqmt	Rs. 2200/-	,,
Wall Cladding Tiles	Sqmt		,,
Granit stone stone	Sqmt	Rs. 2500/-	,,
12 to 20 mm thick 1 st quality wall cladding tiles			
10 to 11mm thick	Sqmt	Rs. 1075/-	

The contractor shall quote the rates of relevant items Considering The basic rate of items as mention above and in that case the contractor shall supply cement and TMT steel, out of the following brands/makes only.

CEMENT:

SANGHI / SAURASHTRA CEMENT / SIDDHI / GUJARAT AMBUJA / ULTRA TECH

STEEL:

SAIL / TISCON / VSP / RINL / NATIONAL / ELECTROTHERM

NOTE:

- 1.0 Conditions for issue of materials are given on the following pages which along with relevant clauses in the section III, the special conditions of contract may be referred to by the contractor.
- 2.0 The quantity of material issued shall be worked out on the following basis.

- a) Each bag of cement as received from supplier/or as stacked in owner/ OWNER's store shall be taken to weigh 50kg.
- b) Weights mentioned in the suppliers invoice/ bills/ vouchers/ RR shall be taken as issued weights for TMT CRS Reinforcement steel.

Tender shall quote hereunder the all inclusive price of labor assumed by him for the purpose of this contract.

Supplying labor	unit	Rate	Amount
i) Unskilled labor male	per day of		
ii) Unskilled labor male	hrs. each		
iii) Skilled labor make			
iv) Mason (brick layer)			
v) Carpenter			
vi) Painter			
Vii) Fitter (structural steel)			
viii) Welder			
ix) Welders with welding equipment			
x) Chaukidar			

Architect shall have the right to ask contractor to supply labor for any work at the rates quoted above.

Signature _____
 Designation _____
 Company _____
 Date _____

SCHEDULE OF RATES FOR MATERIALS

Tender shall quote hereunder the all inclusive price of materials delivered, unloaded and stacked at site assumed by him for the purpose of this contract.

1.	Brick	Crushing Strength (35-50 kg/sq.cm minimum)	Unit 1000/NOS	Rate	Remark
	a)1 st class				
	b)2 nd class				
2.	Cement	43 grade	MT		
		53 grade	MT		
3.	Stone / Aggregate		Cu.m		
	a) 50mm size				
	b) 40mm size				
	c) 25mm size				
	d) 20mm size				
	e) 12.5mm size				
	f) 6mm size				
4.	Bajri (Sand)		Cu.m		
5.	Primary bitumen		Tonne (Metric)		
6.	Bitumen felt		Sq.m		
7.	Particle boards				
	a) Commercial veneering on both sides		Sq.m		
	b) One side teak and other commercial		Sq.m		
	c) Both side teak				
8.	Structural steel (tested)				
	Tees, Angles, Channels, joints plates		MT		
	Chequered plates.				
9.	Tiles				
	a) Ceramic Tiles 200 mm x 300 mm				
	b) Vitrified Tiles 610 mm x 610 mm				
10.	GI pipe B class				
	a) 65mm		RM		
	b) 50mm		RM		
	c) 40mm		RM		
	d) 25mm		RM		
	e) 20mm		RM		
	f) 12mm		RM		

Signature _____
 Designation _____
 Company _____
 Date _____

SECTION : VII SCHEDULES OF SUPPLEMENTARY INFORMATION

The bidder shall provide the Supplementary Information as annexed in the form of schedules mentioned hereunder. All these supplementary information shall be considered for the bid evaluation, and same in the contract execution. If the requisite information is not supplied by the bidder then the bid shall be considered non-responsive and shall be rejected.

- a) Schedule I Major items of Constructional Plant to be deployed by the bidder.
- a') Schedule I(A) Details of Establishment of firm with registration details.
- b) Schedule II Key Personnel.
- c) Schedule III Nominated Sub-Contractors.
- d) Schedule IV Major works successfully completed during the last five years.
- d') Schedule IV(A) Maximum value of single work executed in a year
- e) Schedule V Statement of Bonus earned/Liquidity damages paid in the last five years
- f) Schedule VI Statement of Arbitration & Disputes in the last five years
- g) Schedule VII Financial Business Capability
- h) Schedule VIII Works on Hand

SECTION VII : SCHEDULE - I

Major items of Constructional Plant to be deployed by the bidder.

Sr. No.	Description of Equipment	Nos. available with the Bidder in working condition.	Nos. propo- sed to be deployed at site.
1.	Concrete Mixers		
2.	Vibrators		
	a) Needle type		
	I 60 mm dia		
	II 40 mm dia		
	III 25 mm dia		
	b) Surface type		
3.	Weigh Batcher		
4.	Concrete Cube & material Testing Equipment		
5.	Steel Scaffolding		
6.	Shuttering Material		
	a. Acro form work		
	b. Plywood form work for columns		
	c. Plywood form work for Beams and slabs		
7.	Water Pumps		
8.	Air Compressors		
9.	Welding Equipments		
10.	Lift Elevators.		
11.	JCB M/C		
12.	Dumper/ Tractor/Trucks		
13.	Laboratory Equipments		
14.	Surveying Instruments		
15.	Grouting Equipments		

SECTION VII : SCHEDULE - II KEY PERSONNEL

1. Technical Personnel	No of persons	
	Employed with the bidder	To be Deployed for the Project
a) Senior Engineer		
b) Site Engineer (Degree holder)		
c) Junior Engineer (Degree holder)		
2. Supervisory Personnel		
a) Supervisor (Diploma Holders)		
b) Foremen		
c) Technicians		
3. Other Key Staff.		

SECTION VII: SCHEDULE - III - Nominated Sub-contractors

(List of works of value more than 10% of the contract value proposed to be sublet)

S.No.	Description	Approx. value Rs.	Name of the sub-contractor	Place where similar works previously executed.
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SECTION VII : SCHEDULE IV :

Major works successfully completed during the last five years:
For a single project related to buildings.

Sr. No.	Name of work	Place	Contract Reference	Name of Client	Value of Work	Time of completion	Date of completion
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SECTION VII : SCHEDULE V :

Statement of Bonus earned/Liquidity damages (L.D.) paid in the past five years:

Sr. No.	Name of work	Place	Contract reference	Name of Owner	Value of Work	Time of completion contract Actual	Bonus /L.D

SECTION VII : SCHEDULE VI:

Statement of Arbitration & Disputes in the last five years.

Sr. No.	Name of work	Place	Contract reference	Name of Client	Value of work	Nature of Dispute	Award of Arbitration

SECTION VII : SCHEDULE - VII
Financial and Business Capability.

1. Audited annual accounts/ Accounts
audited under section 44AB of Income tax
Act of past 3 years :

2. Where accounts are not required to be
audited following information shall be
given for last three years duly attested
by a Chartered Accountant/Manager of a
Nationalized bank :
 - a. Share Capital :

 - Free reserves :

 - Other reserves :

 - b. Term loans from financial institutions
and & Banks :

 - c. Current Liabilities :
 - Bank cash credits :

 - Others (Including sundry creditors) :

 - d. Provisions :

 - e. Contingent Liabilities including claims
not acknowledged :

 - f. Fixed Assets :
 - Gross :

 - Net :

 - g. Cash and Bank balances :

 - h. Inventories :

 - i. Debtors & Advances considered good

more than 6 months :

less than six months :

- j. Profit before tax :
- k. Loss, if any :
- 3. Other information
 - Name of the Bankers :
 - Bank facilities including credit limits :
- 4. Projected turn over for the next two years
 - Year 1 :
 - Year 2 :

SECTION VII SCHEDULE VIII

WORKS ON HAND

S.no.	Name of Work	Contract reference	Name of Client	Place of Contract	Value of Contract	Completion period	date
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SECTION VII SCHEDULE VIII

WORKS ON HAND

S.no.	Name of Work	Contract reference	Name of Client	Place of Contract	Value of Contract	Completion period	date
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SECTION VIII FORM OF AGREEMENT FOR CIVIL CONSTRUCTION WORK

THIS AGREEMENT is made and executed on the day of _____ 2017
between the SHREE SOMNATH TRUST (PRABHAS-PATAN) having its
registered office at Somnath (herein after referred to as SHREE
SOMNATH TRUST which expression shall, unless repugnant to the
context or meaning thereof, include the successors and assignees o
f the SHREE SOMNATH TRUST) of the ONE PART and
M/S. _____

_____ (herein after referred to as the
Contractor, which expression, shall, unless repugnant to the
context or meaning thereof, include the heirs, successors,
assignees, executors and administrators of the Contractor) of the
OTHER PART.

WHEREAS the SHREE SOMNATH TRUST is desirous that certain Works
should be executed, viz _____

and has, by Letter of Acceptance dated _____, accepted a
bid by the Contractor for the execution, completion and
maintenance of such works, NOW THIS AGREEMENT WITNESSTH AS
FOLLOWS:

- 1.0 In this agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
- 2.0 The following documents shall be deemed to form and be read and construed as a part of this agreement, viz
 - I) this Form of Agreement
 - ii) the Letter of Acceptance
 - iii) the said bid and Appendix
 - iv) the Technical Specifications
 - v) the Schedule of Quantities
 - vi) the Drawings
 - vii) the Schedule of Supplementary information
 - viii) Special Conditions of Contract
 - ix) General Conditions of Contract
 - x) Schedule of Materials to be issued by SHREE SOMNATH TRUST
 - xi) Form of Bank Guarantees
- * The Contractor shall not fill up this form.
- 3.0 The aforesaid documents shall be taken as complementary and mutually explanatory of one another, but in the case of ambiguities and discrepancies shall take precedence in the order set out above.
- 4.0 In the consideration of the payment to be made by the SHREE SOMNATH TRUST to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the SHREE SOMNATH TRUST to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract.

5.0 The SHREE SOMNATH TRUST hereby covenants to pay the Contractor in consideration of the execution, completion and maintenance of the works the Contract Price at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused their respective Common Seals to be hereunto affixed the day, month and year first above written.

Signed, sealed & delivered for and on behalf of the within named SHREE SHREE SOMNATH TRUST by the hands of its Authorized Signatory .

Authorized Signatory
Shree Shree Somnath Trust
Prabhas - Patan,
Somnath, Ta.Veraval.

In the presence of :

WITNESS:

1) Signature

Name

Address

2. Signature

Name

Address

Signed, sealed and delivered for and on behalf of the within named Contractor, the other part.

In the presence of:

WITNESS

1. Signature

Name

Address

2. Signature

Name

Address

SECTION IX

Acceptable Forms of Bank Guarantees

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		sectional	sequential
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2.0	Retention money	245	

1.0 Performa of Bank Guarantee for Performance Security
On Non-Judicial Stamp Paper of Rs. 100/-

Bank Guarantee no.

Date:

This deed of guarantee made this _____ day of 2016_ (Two thousand and _____) by (Name and the address of the Bank), hereinafter referred to as the bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the Shree Somnath Trust, Prabhas - Patan (hereinafter referred to as the SHREE SOMNATH TRUST) which expression shall unless repugnant to the context or meaning thereof include its legal representative, successors or assigns.

Where as the SHREE SOMNATH TRUST has awarded a contract bearing no. _____ on

M/s. _____
_____ (name and the address of the party), hereinafter referred to as the Contractor, for the execution, completion and the maintenance of _____.

And whereas, the Contractor has agreed to submit a performance security in the form of a bank guarantee to the SHREE SOMNATH TRUST as per the terms and conditions of the bidding documents and the Contract which will be kept valid upto _____ calendar months from the date of bank guarantee (the period should be till end of Period of Maintenance). And whereas, the bank and its duly constituted agent and officer has already read and understood the Contract made between the SHREE SOMNATH TRUST and the Contractor.

In consideration of the SHREE SOMNATH TRUST having agreed to award the Contract on the Contractor , we _____ (the bank), do hereby guarantee, undertake, promise and agree with the SHREE SOMNATH TRUST, its legal representatives, successors and assigns that the within named (the name of the Contractor) their legal representatives and assignees will faithfully perform and fulfill everything within the bidding document and the Contract order on their part to be performed or fulfilled ,at the time(time being the essence of the Contract) and in the manner therein provided, do all obligations there under and we further undertake and guarantee to make payment to the SHREE SOMNATH TRUST a sum of Rs. _____ (Rupees _____ only)

being 5% of the Contract value, in case the Contractor, their legal representatives and assignees do not faithfully perform and fulfill everything within the bidding document and the Contract order on their part to be performed or fulfilled, at the time and in the manner therein provided and do not willfully and promptly do all obligations there under.

In case, the Contractor fails to perform or fulfill the Contract as per the terms and conditions agreed upon, the SHREE SOMNATH TRUST is entitled to demand an amount equivalent to 2% of the Contract value from the Contractor and the demand made by the

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SHREE SOMNATH TRUST itself will be conclusive evidence and proof that the Contractor has failed to perform or fulfill his obligations under the Contract and neither the Contractor nor the Bank shall be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment on any ground whatsoever.

We, (the name of the Bank), do hereby undertake to pay an amount equivalent to 2% of the Contract value, being the amount due and payable under this guarantee, without any demur, merely on a demand from the SHREE SOMNATH TRUST stating that the amount claimed is due by way of non-performance of the Contractual obligations as aforesaid by the Contractor or by the reason of the Contractor's failure to perform the said contractual commitments, any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only) being the amount equal to 2% of the Contract value.

We, the bank, further agree that the performance security herein contained shall remain in full force and effect for a period of _____ calendar months from the date of the bank guarantee (the period shall be till the end of Period of Maintenance) whichever is later or till the SHREE SOMNATH TRUST certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractor and accordingly discharge the guarantee, unless a demand or a claim under this guarantee is made on us in writing by the SHREE SOMNATH TRUST on or before _____ we shall be discharged from all liabilities under this performance security hereafter.

We, the bank, further agree with the SHREE SOMNATH TRUST that the SHREE SOMNATH TRUST shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and the conditions of the bidding document and the Contract or to extend the time of performance by the said Contractor from time to time or postpone time or from time to time and any of the power exercisable by the SHREE SOMNATH TRUST against the Contractor and to forbear or enforce any of the terms and conditions relating to the said bidding document and the Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor, or for any forbearance, act or omission on the part of the SHREE SOMNATH TRUST to the said Contractor by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us. This guarantee shall be in addition to and without prejudice to any other securities or remedies which the SHREE SOMNATH TRUST may have or hereafter possess in respect of the works executed or intended to be executed and the SHREE SOMNATH TRUST shall be under

no obligation to marshal in favor of the bank any such securities or funds or asset that the SHREE SOMNATH TRUST may be entitled to receive or have a claim upon and the SHREE SOMNATH TRUST at its absolute discretion may vary, exchange, renew, modify or refuse to complete to enforce or assign any security or instrument.

The bank agrees that the amount hereby guaranteed shall be due and payable to the SHREE SOMNATH TRUST on serving us with a notice, requiring the payment of the amount and such notice shall be deemed to have been served on the bank either by actual delivery thereof to the bank or by dispatch thereof to the bank by registered post at the address of the bank.

Any notice sent to the bank at its address by registered post shall be deemed to have been duly served on the bank notwithstanding that the notice may not in fact has been delivered to the bank.

In order to give full effects to the provisions of this guarantee the bank hereby waives all rights inconsistent with the above provisions and which the bank might otherwise as a guarantor be entitled to claim and enforce.

We, _____, lastly undertake not to revoke this guarantee during its currency except with the previous consent of the SHREE SOMNATH TRUST in writing and the guarantee shall be a continuous and irrevocable guarantee upto a sum of Rs. _____ (Rupees _____).

The guarantee shall remain in force until _____ and unless the guarantee is renewed or a claim is preferred against the bank

within three months from the said date (the date of expiry) all rights of the SHREE SOMNATH TRUST under the guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

SIGNATURE

PLACE

SEAL

DATE

CODE NO.

NOTE: The Contractor should ensure that the seal and the code no. of the signatory is put by the bankers, before submission of the bank guarantees.

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2.0 Performa of Bank Guarantee for Bid Security
On Non-Judicial Stamp Paper of Rs. 100/-

Bank Guarantee no. _____

Date: _____

This deed of guarantee made this _____ day of 2016 (Two thousand and _____) by (Name and the address of the Bank), hereinafter referred to as the Bank, thereof includes its legal representatives, successors and assigns and the Shree Somnath Trust, Prabhas - Patan (hereinafter referred to as the SHREE SOMNATH TRUST which expression shall unless repugnant to the context or meaning thereof include its legal representative, successors or assigns.

Whereas the SHREE SOMNATH TRUST has invited bids for the Construction of the proposed _____

by the Invitation to bid no. _____ .

AND WHEREAS M/s _____

(Name and the Address of the bidders) who having submitted their bids (hereinafter referred to as the Tender) and have agreed to deposit to the SHREE SOMNATH TRUST an amount indicated in the Invitation to bid as per the terms and the conditions of the bidding documents. AND WHEREAS the SHREE SOMNATH TRUST is also willing to accept a Bank guarantee in lieu of payment by demand draft of any amount equivalent to the amount of bid security required to be deposited by the bidder to the SHREE SOMNATH TRUST which guarantee shall be kept valid for 120 days after the day of the opening of the bids.

In consideration of the SHREE SOMNATH TRUST having agreed to consider the bid proposals having submitted by the bidder without depositing the amount of bid security and against this Bank guarantee, we (name and the address of the Bank) hereby undertake and guarantee to make payment to the SHREE SOMNATH TRUST the amount of bid security or any part thereof not deposited by the bidder to the SHREE SOMNATH TRUST at any time (time being the essence of the Contract) when the SHREE SOMNATH TRUST asks for the same as per the terms and the conditions of the bidding documents within 120 days from the date of opening of the bids.

The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the SHREE SOMNATH TRUST in writing and the guarantee shall be continuous and irrevocable guarantee upto a sum of Rs. _____ (Rupees _____ only)

provided always that any indulgence or forbearance on the part of the SHREE SOMNATH TRUST to the said bidder, with or without the consent of the Bank shall not prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defense by the Bank against the SHREE SOMNATH TRUST.

In case the SHREE SOMNATH TRUST puts forth a demand in writing on the Bank for the payment of the amount in full or in part against this Bank guarantee, the Bank will consider that such demand by itself

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is a conclusive evidence and proof that the bidder has failed in complying with the terms and conditions stipulated by the SHREE SOMNATH TRUST in its bidding document and payment will be made to the SHREE SOMNATH TRUST without raising any disputes regarding the reasons for such failures on the part of the bidder.

The Bank shall not be discharged or released from this guarantee by any arrangement between the bidder and the SHREE SOMNATH TRUST with or without the consent of the Bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the SHREE SOMNATH TRUST to the bidder.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the SHREE SOMNATH TRUST may have or hereafter possess against the bidder and the SHREE SOMNATH TRUST shall be under no obligations to marshal in favor of the Bank any such securities or fund or assets that the SHREE SOMNATH TRUST at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any security or instrument. The Bank agrees that the amount hereby guaranteed shall be due and payable to the SHREE SOMNATH TRUST on SHREE SOMNATH Trust's serving with a notice requiring the payment of the amount and such notice shall be served on the Bank either by actual delivery thereof to the Bank or by dispatching thereof by to the Bank by registered post at the address of the said Bank. Any notice sent to the Bank at its address by registered post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to the Bank.

In order to give full effect to the provisions of this guarantee the Bank thereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

The guarantee shall remain in force until _____ and unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date all rights of the SHREE SOMNATH TRUST under this guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

Notwithstanding anything contained here before , our liability under this guarantee is restricted to Rs. _____ (Rupees only)

being the amount of the Bid security and it shall remain in force until _____

Place

Signature

Seal

Code no.

Note Bidders should ensure that the seal and code no. of signatory is put by the Bankers , before submission of the Bank guarantees.

4.0 Performa of Bank Guarantee for Retention Money

On Non-judicial stamp paper of Rs 100/-

Bank Guarantee no.

Date:

This deed of guarantee made this _____ day of 2016 (Two Thousand _____ and _____) by (Name and the address of the Bank), hereinafter referred to as the Bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the Shree Somnath Trust, Prabhas - Patan (hereinafter referred to as the SHREE SOMNATH TRUST which expression shall unless repugnant to the context or meaning thereof include its legal representative, successors or assigns.

WHEREAS the SHREE SOMNATH TRUST has placed its Contract order bearing no. _____ dated _____ on (name and address of the party) hereinafter called the Contractor, for the construction of

AND WHEREAS the SHREE SOMNATH TRUST has agreed to pay to the Contractor the retention money i.e. 5% of the value of the Contract on submission of a Bank guarantee of equal amount, which will be kept valid upto _____

In consideration of the SHREE SOMNATH TRUST having agreed to pay to the Contractor Rs. _____ (Rupees _____ only)

being the retention money i.e. 5% of the value of the Contract , we (the Bank), hereby undertake and guarantee to make repayment to the SHREE SOMNATH TRUST of the said 5% amount or any part thereof which does not become payable to the Contractor by the SHREE SOMNATH TRUST in accordance with and subject to the terms and conditions of the said Contract. The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the SHREE SOMNATH TRUST in writing and this guarantee shall be a continuous and irrevocable guarantee upto a sum of Rs. _____ (Rupees _____ only).

The Bank shall not be discharged or released from this guarantee by any arrangement between the Contractor and the SHREE SOMNATH TRUST with or without the consent of the Bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the SHREE SOMNATH TRUST to the Contractor and the same shall not prejudice or restrict remedies against the Bank nor shall the same in any event be a ground of defense by the Bank against the SHREE SOMNATH TRUST We do hereby undertake to pay an amount equal to 5% of the Contract value being the amount due and payable under this guarantee without any demur, merely on a demand from the SHREE SOMNATH TRUST stating that the amount claimed is

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due to the SHREE SOMNATH TRUST. In case, the Contractor fails to perform or fulfill the Contract as per the terms and conditions agreed upon, the SHREE SOMNATH TRUST is entitled to demand an amount equal to 5% of the Contract value from the Contractor and the demand made by the SHREE SOMNATH TRUST by itself will be conclusive evidence and proof that the supplier has failed to perform or fulfill his obligations and neither the Contractor nor the Bank shall be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment on any ground.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the SHREE SOMNATH TRUST may have or hereinafter possess in respect of the works executed or intended to be executed and the SHREE SOMNATH TRUST shall be under no obligation to marshal in favor of the bank any such securities or funds or assets that the SHREE SOMNATH TRUST may be entitled to receive or have a claim upon and the SHREE SOMNATH TRUST at its absolute discretion may vary, exchange, renew, modify or refuse to complete to enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the SHREE SOMNATH TRUST on SHREE SOMNATH TRUST's serving with a notice requiring the payment of the amount and such notice shall be served on the Bank either by actual delivery thereof to the Bank or by dispatching thereof by to the Bank by registered post at the address of the said Bank. Any notice sent to the Bank at its address by registered post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to the Bank.

In order to give full effect to the provisions of this guarantee the Bank thereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

Notwithstanding anything contained here before , our liability under this guarantee is restricted to Rs. _____ (Rupees _____ only)

being the amount of the retention money and it shall remain in force until _____ and unless it is renewed for a further period or a claim is preferred against the bank within three months from the said date (date of expiry) all rights of the SHREE SOMNATH TRUST under the guarantee shall cease and the bank shall be released and discharged from the liabilities hereunder.

Place

Signature
Seal

Code no.

Note Bidders should ensure that the seal and code no. of signatory is put by the Bankers , before submission of the Bank guarantees.

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